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February 3, 1934

No. 5



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RAILWAY AGE

The "Unprogressive" Railroads

The most notable feature of Co-ordinator Eastman's first report is that, after reviewing railroad conditions and problems as shown by the mass of information he had assembled, he did not express any wholesale criticisms of railroad management or advocate any revolutionary changes in the near future in ownership, development or management. He hazarded the opinion that government ownership would be the best and ultimate solution of the railroad problem, and outlined a plan of government organization and management, but he did not advocate but opposed, early adoption of government ownership. Mr. Eastman's failure to express wholesale criticisms or suggest definite revolutionary changes in the near future was due, in our opinion, to the comprehensiveness and detail of the information he had before him.

Many wholesale criticisms of railroad management have been expressed and several plans for wholesale changes in the financial structure, ownership, organizations and methods of the railroads have been advocated. They usually have emanated, however, from persons who had taken only a birdseye view of the situation. Such persons apparently have usually looked at a map of the railroads and seen that it could have been made more symmetrical, and that if the railroads were going to be constructed now many of the lines that at present appear upon the map would be omitted. They have taken a look at railway statistics and concluded that by changing and reducing the lines upon the map the operating and financial results disclosed by the statistics could be greatly improved.

Mr. Eastman Hampered by Facts

Mr. Eastman, like those who have actually managed the railways, or who manage them now, had responsibilities and duties which made it impossible for him to confine himself to a birdseye view of the map and an examination of statistics. He was required by law to offer practical suggestions for the accomplishment of definite purposes, and therefore he had to ascertain the conditions which actually exist and study the problems presented by these actual conditions. He had to

face the fact that, as he said, "the railroad industry, as modern industries go, is old * * * with its roots in the pioneer past," and that the problems of a huge industry "with its roots in the pioneer past" present difficulties not presented by those of a new industry, such as the motor vehicle industry. He had to consider not only competition between the railroads themselves, but the consequent and closely related competition between communities and entire territories which would be affected by radical changes or reductions in railroad competition. He had to give weight to the property rights of different railroad companies. He had to give weight to the human nature which is manifested in the railroad business not only by the rivalries between different railways but, also, by the attitude and demands of the communities they serve and the old and powerful labor unions composed of railway employees.

In other words, unlike most of those who make wholesale criticisms of railway managements, and offer simple and comprehensive solutions of railroad problems, Mr. Eastman was hampered in writing his report, not only by his definite and weighty responsibilities and duties, but by a comprehensive knowledge of numerous very stubborn and complicated conditions and facts.

Private Versus Government Management

Many a fine theory has been killed by a fact, and the *Railway Age* modestly admits that if its style had not been so cramped by a knowledge of railroad facts it could have offered some theoretical solutions of railroad problems quite as glittering and appealing to the mob mind as those which have emanated from less informed sources. Unfortunately, this paper has been hampered by knowledge, and as we have repeatedly surveyed the field we have as repeatedly reached the conclusion that the best, and probably the only, solution of the railroad problem under private ownership is for the railroads themselves voluntarily, in Mr. Eastman's language, to "form a more perfect union" to deal with matters of common concerns," and it is impossible for us to understand how a man who can

assemble, digest and reason from facts as Mr. Eastman does can still hold to the belief that government ownership would be a better solution. It is true that private business management in this country, including railroad management, has had and still has serious shortcomings, but when and where has there been any experience with government in this country, national, state or local, that has not disclosed at least equal shortcomings in dealing with ordinary governmental problems and much greater shortcomings in dealing with problems of business? If there has been unwise investment, reckless expenditure, and dishonesty in business during the last decade, has there not also been unwise investment, greater inefficiency, reckless extravagance and almost every form of graft and dishonesty by and in our governments?

The managements of our railways, whatever may have been their shortcomings, certainly have made a better record of efficiency, economy and honesty during the last ten years than any of our governments, and in view of that plain fact, and of the fact that there is no apparent reason for believing that government in the railroad business would be any better than government in anything else, it is extremely hard to understand how anybody can anticipate that under government ownership the efficiency, economy and honesty of railroad management would be increased, or even maintained.

The True Railroad Record

It has become the fashion among those who are influenced by propaganda emanating principally from manufacturers of motor trucks and buses to assert, without offering any evidence in support of the charge, that there has been no progress recently in railway development, management, operation and service. What actually has been the history of our railways since the termination of the depression of 1921-1922? Most persons have forgotten that the principal problem with which the railroads were confronted only eleven years ago was that of so enlarging and improving their service as to provide adequate and satisfactory transportation. They so completely and expeditiously solved that problem that for more than ten years there has never been any complaint about "car shortages," although for some years before there had been nationwide and almost constant complaint regarding them. Between 1920 and 1929 they increased the average movement of each freight car daily from 25.1 to 32.3 miles, or 29 per cent, while between 1920 and 1933 they increased the average speed of their freight trains from 10.3 to 15.7 miles per hour, or 52.4 per cent. Between 1920 and 1932 fatal accidents to railway employees were reduced 54 per cent in proportion to the number of employees, and fatal accidents to railway passengers were reduced 70 per cent in proportion to the number of passengers carried. Was there no progress during a period when such great improvements in operation and service were made? The railways handled substantially more freight business in 1929 than in

1920, but meantime reduced their operating expenses 21½ per cent, or \$1,250,000,000 annually, while increasing the average hourly wage paid by them. Does that indicate that there was no progress in railroad efficiency and economy?

Progress Without Research?

But, it is said, they did not carry on enough research. "Research" is a word which may be given a narrow or broad connotation. Did the railroads so greatly improve their service and reduce their operating expenses without making the investigations, and the improvements in plants and methods, necessary to accomplish these results? Again, it is said that they did not show progressiveness in developing means of meeting highway competition. Excepting that of the private automobile, highway competition did not become highly effective until late in the recent period of prosperity. Its effectiveness has been due to four factors—first, the subsidizing of such competition by the provision of highways at the taxpayers' expense; second, failure to regulate it or relax railway regulation; third, differences in working conditions and wages of employees; fourth, the characteristics of highway vehicles.

The railways certainly cannot be charged with responsibility for the fact that their highway competitors have been subsidized and not regulated and have paid low wages. As to the part of the competitive situation created by the characteristics of highway vehicles, the railways have been confronted with the question as to whether they should themselves acquire and operate buses and trucks, or could and should develop, to compete with them, vehicles for operation by rail. They have extensively tried, and are still trying, both methods. They could have experimented in more various and extensive ways if the depression had not enormously reduced their revenues and threatened many of them with bankruptcy just when they most needed money with which to do experimentation.

The Railroads a Sound Industry

They are doing much of such experimentation now, in spite of their financial difficulties. The new Union Pacific streamlined, aluminum, light-weight passenger train, which is described at length elsewhere in this issue, and the new streamlined, stainless steel, light-weight passenger train which has been ordered by the Burlington, afford the most striking examples of such experimentation, but numerous other examples could be cited. Has the rapid and widespread adoption of air-conditioning of passenger cars, when new capital for railroads has been so hard to get, no significance as indicating the disposition of railroad managements to adopt improvements as rapidly as they are able?

Any discussion which did not mention the way in which the railways have financially and physically stood the depression would be wholly inadequate in indicating the results of the kind of management they had during recent years of prosperity. Mr. Eastman's ref-

erences to the much greater increase that occurred in their investment than in their capitalization, and especially their indebtedness, call attention to the fact that during this period of financial "whoopie" the railroads probably were the most conservatively financed of all American industries. It is true that many of them have become bankrupt, but was it reasonably to be expected that all the units composing an industry which in 1932 and 1933 had annual gross earnings less than one-half as great as in 1929, would be able to remain solvent?

In spite of this reduction of more than 50 per cent in gross earnings, and the consequent necessity of making the most drastic retrenchments in capital and maintenance expenditures, the railways during the depression have rendered the best, fastest and safest service in their history. Do such facts as these indicate that the railroad industry, as a result of past and present incompetency and unprogressiveness in management, has become so moribund and decayed that, regardless of the prospective increases in its traffic and gross and net earnings, it must be revolutionized and largely scrapped if it is to be able to continue to exist and to be of any service and value to the American people?

Revolutions Versus Progress

The plain fact is, that the two main things that are the matter with the railroads is that they are suffering with other industries from the effects of the depression, and suffering in addition from the effects of unfair competition aided and largely created by unfair government policies. Fundamentally, their finances, physical properties, organizations and managements are as sound as are those of any other industry in the United States. This is the principal difficulty encountered by those who would like to propose some grandiose scheme for saving the railroads, but who take the pains to inform themselves regarding actual conditions and facts before formulating their plans.

When there has been enacted the tragedy of a theory killed by a fact, there usually has been some vital weakness in the theory. In a period when the mob mind eagerly accepts the view that the only remedy for every unsatisfactory economic condition is some kind of a revolution, the *Railway Age* declines to accept the view that the only solution of the railroad problem is a railroad revolution. We never had much respect for the mob mind. We have less respect for it now than we ever had. It accepted, without the least skepticism, the "new era" a few years ago, and it accepts now, with as little skepticism, the "new deal" with all its revolutionary policies and purposes. The *Railway Age* does not believe much in revolutions. It believes that progress is made by building on and improving every fundamentally sound institution that has come down from the past. It believes the railroads are a fundamentally sound industry, and that therefore railroad progress must be made in the future, as it has been in the past, by bold experimentation with improvements carried on with due regard to experience.

Seemingly Slight Defects Injure Freight Business

The railroads are facing squarely into an intense effort to regain freight traffic that has been lost to highway and waterway carriers. Unlike the railroads these carriers are unhampered by restrictive regulation, can change their rates at will, do not pay standard wages, and are furnished with rights-of-way, largely at public expense.

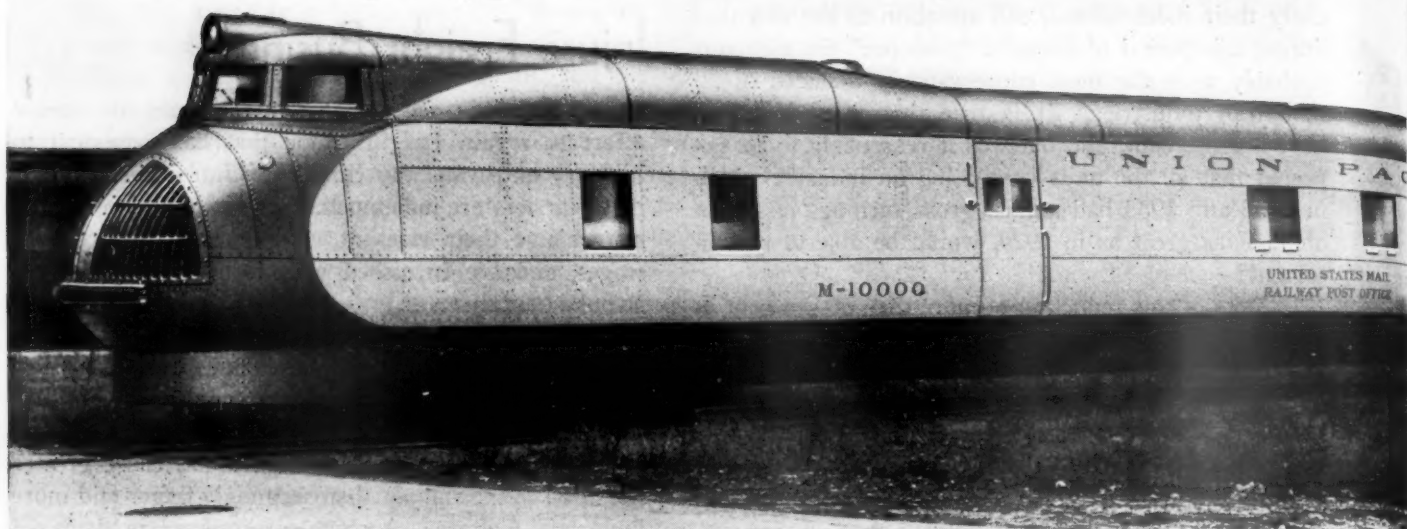
The fight against such unfair competition promises to be a long, hard struggle, and every possible attempt should be made, no matter how small, to secure and hold the goodwill of shippers. Sometimes small items, which appear almost insignificant, cause greater irritation to the shipper than seemingly larger and more important matters. A shipment received in damaged condition is frequently worse than no shipment at all; that is, so far as the mental reactions of the consignee are concerned.

Nails applied by the shippers to secure lading, cleats, etc., are not always removed when the car is unloaded; these, or nails which work up through the floors, cause considerable damage to sack goods. Many sacks of flour, sugar, etc., torn by such nails, are rejected and turned back to the carriers. The freight claim rules clearly require the carrier furnishing the equipment to inspect it while empty and before each load, to see that it is free from defects which may cause damage. Surely, considering the hazards involved in the loss of goodwill and business, ways and means can be found to meet this requirement more fully.

Nails are frequently driven through box car sides to secure bracing or for other purposes. When removed, the holes should be plugged; if not, during driving rainstorms they may be a source of damage to some types of lading.

The two instances mentioned are typical of a number of seemingly insignificant items that freight loss and damage experts are familiar with and which cause continual irritation to the shipper. True, they always have existed to a greater or less extent, and because of such continued existence we seem to become hardened to them.

Is it not true, however, that we have now entered a new era in freight transportation in this country, and that with these changed conditions no effort must be overlooked, no matter how small, to make the service more reliable and efficient than ever before? A strenuous educational campaign may be required to drive this home to the great body of railway employees that are involved, directly or indirectly, in the safe and efficient transportation of freight. Possibly only in this way can attention be focused upon the wide variety of details, such as those mentioned above, which must be corrected if the railroads are to give the most effective service and guard against losing the goodwill and patronage of shippers.



Union Pacific Three-Car, High-Speed Train

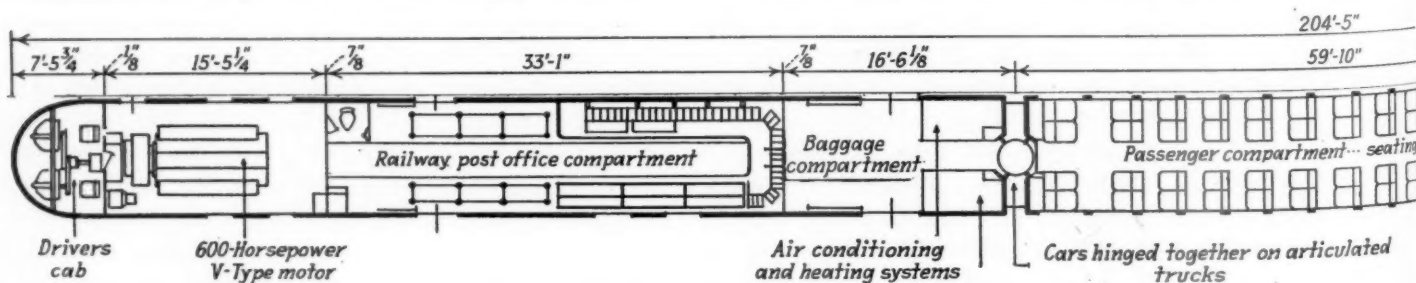
Union Pacific Installs Light-Weight High-Speed Passenger Train

First motor-driven, three-car, articulated, streamlined train is featured by aluminum construction—Will be tested in transcontinental service

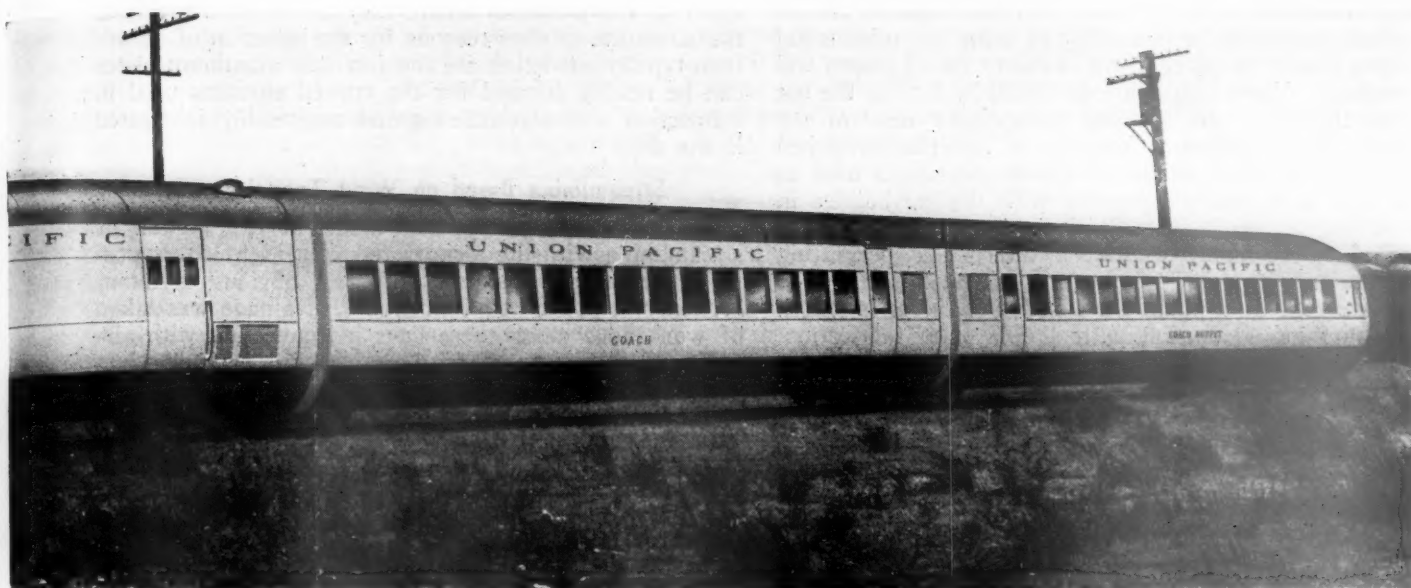
BELIEVING that the restoration of anything like a satisfactory volume of passenger business to the rails is dependent on the development of a radically different type of passenger equipment, the management of the Union Pacific System, early in 1933, authorized the expenditure of \$200,000 for such a train which would provide safe, fast and comfortable transportation at a minimum cost. The order for this train was placed with the Pullman Car & Manufacturing Corporation, which co-operated in designing and has just completed the building of the first three-car train. Driven by a 600-hp., 12-cylinder, distillate-burning engine, with electric transmission, this train will be operated on special runs between the larger cities on the Union Pacific System, with the purpose of demonstrating its practicability for regular main-line through passenger-train service, including transcontinental.

While this first train does not have sleeping accommo-

dations, it is expected to demonstrate its adaptability for long transcontinental runs, and a light-weight sleeping car, embodying the same general principles of construction, has already been designed. In fact, the Union Pacific has ordered from the same car builder a second train of six articulated cars, including a power car with a 900-hp., 12-cylinder, V-type Diesel engine, a mail-baggage car, three Pullman sleeping cars and a combined coach and observation-buffet car. This train, like the first, will be of aluminum construction, completely streamlined and fully air-conditioned throughout. The three Pullman sleepers, which will be built of aluminum alloy, not only will follow the exterior streamlined design of the new Union Pacific train, but will incorporate a number of innovations for the added comfort and convenience of passengers. Plans for the run on which the second train will be placed are still indefinite and cannot be determined until the train is completed and tested.



Floor Plan of the Three-Car, Articulated, High-Speed Train, Built for the Union



Construction work on the second train is not yet sufficiently advanced to permit setting a date for its delivery.

Principal Features of the Three-Car Train

The three-car train consists of a forward car, 72 ft. 8 in. long, containing the power plant, a 33-ft. mail compartment and a small baggage room; a second car, 59 ft. 10 in. long, which is a coach, seating 60 passengers; and a rear car, 71 ft. 11 in. long, which is a coach, seating 56 passengers, with a buffet in the rear for serving light meals to passengers at their seats. The overall length of this train is 204 ft. 5 in., and its estimated weight, 170,000 lb. The train is about 8 in. narrower and the car roof 3 ft. lower than in conventional car design, and this substantially reduced cross-sectional area, in conjunction with light weight, streamlined design, and the power plant provided, is expected to permit developing a balanced speed of 90 m.p.h. on tangent level track and a maximum speed, under favorable conditions, of 110 m.p.h.

In the interests of safety at high speeds, the new train is designed with a low center of gravity, and provision is made in the truck design to assure easy riding under this condition. The bottoms of the cars are but 9½ in. above the rails while the tops of the cars are only 11 ft. above the rails. In the new train, the passengers are seated 16 in. nearer the ground than in the conventional train, and the center of gravity is 38 in. above the rails, or 20 in. lower than in the ordinary railroad coach.

The aluminum car bodies are tubular in shape, and form a deep, stiff beam, thereby requiring a minimum of material for a given strength. These car bodies are joined in an articulated construction which permits the three cars to be supported by, and operated on, four

trucks, two less than would normally be required. The four-wheel truck frames are made of a special alloy cast steel and, with the steel wheels and axles, bolsters, special castings, power-plant parts, etc., constitute the only steel used in the train.

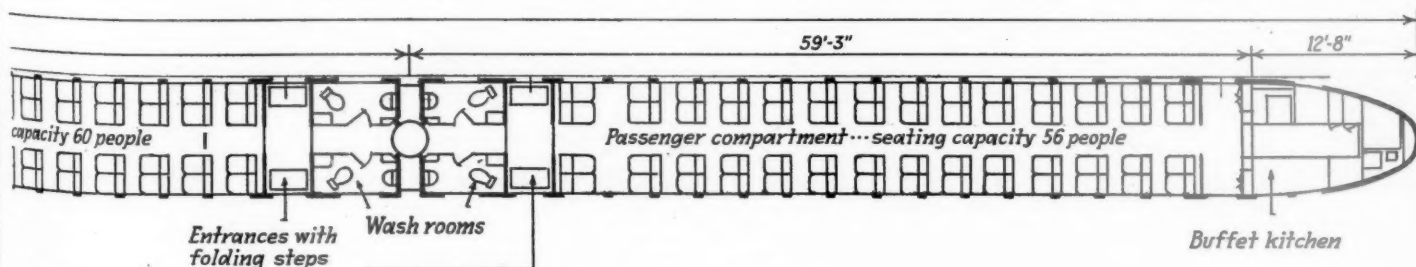
Other features of the train which are expected to prove of wide popular acceptance are: The air-conditioning for both summer and winter; safety glass windows, permanently set in rubber to exclude dirt; extensive use of rubber in the trucks to reduce noise and promote easy riding; attractive interior decorative scheme, coupled with unusually comfortable four-position seats, indirect lighting, buffet service, etc.

For maximum visibility, the exterior color scheme of the train is a golden brown on the canopied roof and the bottom of the train, with the sides finished in a canary yellow. Two headlights of special construction are provided, one having a horizontal and the other a vertical beam to give added protection from a visibility standpoint. A powerful siren with long audibility range will be used for high speeds, supplemented by the usual type of siren and a gong for use in towns, yards, etc.

Aluminum Construction Chosen for Light Weight

A study was made of all available materials, including aluminum alloys, stainless steel and other steel alloys with physical properties, intermediate between ordinary steel and stainless steel. In order to obtain extreme light weight, the choice narrowed down to aluminum alloys versus stainless steel. It was finally decided to use aluminum alloys for the entire car structure except for the bolsters, articulation castings and truck frames, for which special alloy cast steel was used, having high tensile strength, high yield point and great ductility.

A number of factors led to the adoption of aluminum-



Pacific by the Pullman Car & Manufacturing Corp. and Featured by Aluminum Construction

alloy construction for this particular development, an important one being the possibility of using extruded metal shapes to take the place of the ordinary rolled shapes and pressings. These shapes are produced by forcing the hot metal through a die forming the cylinder head of the press. The Aluminum Company of America furnished all of the standard aluminum plates and shapes used in the new train and co-operated with the car-builder in producing all necessary extruded shapes. These shapes are said to be highly accurate in dimensions, permitting the designer to interlock various extruded sections to produce cars of a minimum weight, maximum strength and minimum deflection with simple shop fabrication.

One of the drawings shows a half cross section of the light-weight train with the extruded sections indi-

cated in the positions where they are used throughout the structure. Other reasons for the selection of aluminum-type construction are the fact that aluminum plates can be readily formed for the curved surfaces used in connection with streamlining and are readily fabricated in the shop.

Streamlining Based on Wind Tunnel Tests

An exhaustive study was made in the matter of streamlining with the idea of reducing as much as possible the wind resistance with the obvious resultant economy in power requirements. Advantage was taken of work done along these lines in connection with aircraft development. This, however, did not take into account the effect of ground resistance. The stream-

Partial List of Specialties on the Union Pacific Three-Car Train

Specialties	Manufacturer	Address
Car-builder, complete train.....	Pullman Car & Mfg. Corp.....	Chicago
Also furnished hardware, mail fixtures, handbrake, car seats, etc.		
Aluminum used for car bodies.....	Aluminum Company of America.....	Pittsburgh, Pa.
Alcoa tread plates.....		
Power plant, 12-cyl., 600-hp. engine.....	Winton Engine Corporation.....	Cleveland, Ohio
Aux. battery-charging generator.....	(Division of General Motors)	
Main 425-kw. generator for power plant.....	Westinghouse Elec. & Mfg. Co.....	Pittsburgh, Pa.
Micarta window capping.....		
Circuit breaker.....		
Two 300-hp. traction motors.....	General Electric Company.....	Schenectady, N. Y.
Transformer, 220 volts to 32 volts.....		
Two 25-cu. ft. p. m. air compressors.....		
Electric refrigerating unit in buffet.....		
Commonwealth cast-steel truck frames.....	General Steel Castings Corp.....	Granite City, Ill.
Truck springs.....	Railway Steel Spring Company.....	New York
Special steel castings.....	American Steel Foundries.....	Chicago
Oilite wear plates.....		
Rolled-steel wheels and axles.....	Illinois Steel Company.....	Chicago
New type air brake.....	New York Air Brake Company.....	New York
Slack adjusters.....		
Roller bearings throughout.....	S K F Industries, Inc.....	New York
Safety glass in all windows.....	Pittsburgh Plate Glass Co.....	Pittsburgh, Pa.
Interior paint.....		
Oil-fired heaters—Thermostat control.....	Vapor Car Heating Company, Inc.....	Chicago
Brake shoes, Diamond S.....	American Brake Shoe & Fdry. Co.....	New York
Rubber used for insulation purposes, damping vibration in trucks, side bearings, bumper, etc.	United States Rubber Company.....	New York
	Lord Manufacturing Company.....	Erie, Pa.
	Waugh Equipment Company.....	New York
	Allegheny Steel Company.....	Pittsburgh, Pa.
	Shakeproof Lock Washer Co.....	Chicago
	McConway & Torley Company.....	Pittsburgh, Pa.
	Electric Storage Battery Co.....	Philadelphia, Pa.
Stainless steel (buffet).....	Pyle-National Company.....	Chicago
Shakeproof screws.....	Hayes Corporation.....	Elkhart, Ind.
Emergency drawbar.....	Ashton Valve Company.....	Boston, Mass.
Storage battery, Exide-Ironclad.....	Leslie Company.....	New York
Headlights and marker lamps—Conduit fittings, vapor-proof lighting fixtures, gage lamps, etc.	Graham-White Sander Corp.....	Roanoke, Va.
Window wipers.....	General Electric Company.....	Schenectady, N. Y.
Duplex air brake gage.....	National Carbon Company, Inc.....	Chicago
Tyfon air horns.....	DuPont de Nemours & Co., E. I.....	Wilmington, Del.
Four sanders.....		
Electric speed indicator.....	Union Asbestos & Rubber Co.....	Chicago
Flashlights for crew and tool kits.....	David E. Kennedy, Inc.....	Chicago
Flexible hot-air connections.....	Johns-Manville Corporation.....	Chicago
Exterior enamel.....	Masonite Company.....	Chicago
Rokfos insulation, general.....	Kohler Company.....	Kohler, Wis.
Cork tile floor covering over Magnesite.....	General Refrigerator Company.....	Beloit, Wis.
Masticoke on toilet floors and platforms.....		
Presdwood drums between cars.....	Louis Allis.....	Milwaukee, Wis.
Aux. electric generating unit—7½ kw.....	Duff Engineering Company.....	Nebraska City, Neb.
Compressors for air-conditioning.....	Allen-Bradley Company.....	Milwaukee, Wis.
Compressor gage.....	American Blower Corporation.....	Chicago
Compressor motors.....		
Blower for motors.....		
Carburetors.....	Penn Electric Switch Company.....	Des Moines, Iowa
Motor-starting switch.....	Detroit Lubricator Company.....	Detroit, Mich.
Condenser fan.....	Worthington Pump & Mchy. Corp.....	Chicago
Blower for air-conditioning.....	Economy Pump Company.....	Chicago
Pressure switches.....	Chase Brass Company.....	Chicago
Expansion valves.....	Graybar Electric Company.....	New York
Water pumps.....	Hazard Wire Works.....	Wilkes-Barre, Pa.
Circulating pump.....	Safety Car Heating & Lighting Company.....	New Haven, Conn.
Air-conditioning pipe and fittings.....	The Cochrane Company.....	Chicago
Condulets.....	Yale & Towne Mfg. Co.....	Stamford, Conn.
Wire and cable.....	Dunier Company.....	Chicago
Mail-room lamps.....	Brunswick-Balke-Collender Co.....	Chicago
Aisle carpet strips.....	Adams-Westlake Company.....	Elkhart, Ind.
Locks in buffet, etc.....	Imperial Brass Company.....	Chicago
Hoppers.....		
Hopper seats and lids.....	Crane Company.....	Chicago
Folding washstand.....	National Lock Washer Company.....	Newark, N. J.
Soap dispensers.....	Orinoka Mills.....	New York
Washstand faucets.....	Wm. Wiese & Co.....	New York
Sink faucets.....	Steiner Sales Company.....	Chicago
Shade rollers.....	Stearnes Company.....	Chicago
Window-shade fabric.....	Ottenheimer & Company.....	Chicago
Seat-covering material.....	International Silver Company.....	Chicago
American continuous towel cabinet.....	Beetleware Corporation.....	New York
Oil-burning range and urn.....	Mandel Brothers.....	Chicago
Buffet equipment.....	Aluminum Utensil Company.....	New Kensington, Pa.
Silverware.....	Karpen Bros.....	Chicago
Light-weight dishes and tumblers.....		
Special linen, lunch cloths, napkins, etc.....		
Cooking ware.....		
Consultant on interior decoration.....		

lined design was determined as a result of a series of scientific tests with scale models in the wind tunnel in the University of Michigan at Ann Arbor, Mich. Wooden models of the train, built to a scale of $\frac{3}{8}$ in. per ft., were provided with detachable fronts and rears. Various-shaped front ends and rear ends were constructed and all subjected to wind tunnel tests. Based upon the results obtained in these wind tunnel tests, the final form of the train was determined, and a fairly accurate estimate made of the power required for the speed desired.

Tests of the streamlined models indicated the desirability of a smooth canopy, closing up the gap between the sections, but the accomplishment of this was a difficult task, taking into account the relative movement between car sections on curves, etc. An aluminum shield extends from the rear end of the forward section toward the front end of the following one, which is the prolongation of the car contour. The extent of this projection is contingent on the minimum radius of the curve to be negotiated. Closing up this gap between the hood projection and the following car section is a rubber sheet rigidly attached to the following car section, assuming the contour of the car and free to move at its forward edge. Spring-actuated arms, mounted on the drum portion of the articulation with rollers bearing on the inner side of the projecting hood, keep this rubber stretched to close up the gap between the hood and the following car section.

To minimize air resistance still further, all trucks are shrouded, wind-tunnel experiments on scale models having developed that the total air resistance of the train was thus capable of being reduced about 20 per cent from the truck shrouding alone.

Another factor in reducing air resistance at high speeds is the fact that all windows and doors are set flush, as nearly as practicable, with the exterior of the train. Coach doors, conforming to the exterior contour of the cars, are hinged and swing outward. The mail and baggage doors are opened by a special device which first moves the entire door inward several inches and then slides it open lengthwise of the train on the inside. The coach side doors are interlocked with steps which fold up and down as the doors are closed or opened. A flush trap door inside the car synchronizes its operation with the movements of the corresponding door and steps.

Features of the Structural Design

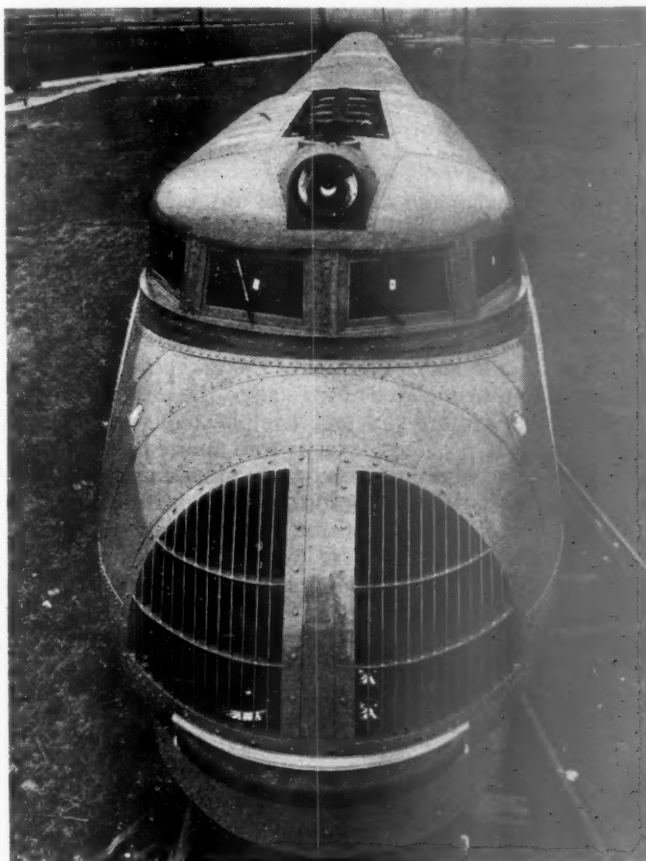
In order to secure the greatest strength with the least amount of material, a tubular cross section for the train was adopted, with the outer surfaces of aluminum sheets and framework built up of extruded aluminum-alloy sections. All of the metal in the framing is co-ordinated to act as a unit, whether for draft or buff, as it is impossible to deflect or stress any member without having adjacent members bear their proportion of the stress. This differs widely from the ordinary form of car design in which draft or buffing shocks are taken care of by longitudinal underframe members. The conventional underframe transmits certain loads to the side frame and the roof, but, due to its design, only part of its area can be utilized for load-carrying; in other words, much of the material or section in the conventional type of car construction does not take its proper part of the stress.

By making the cross section of the car a tube, a large moment of inertia was obtained, which means closely-controlled deflections, compensating for the high deflections otherwise produced by the low modulus of elasticity of aluminum. The basic principle which the Pull-

man Car & Manufacturing Corporation developed in designing cars of this type is that gusset connections should be avoided; all longitudinal members should extend the entire length of the car section; and transverse members should be in one piece for at least one-half of the cross section.

As will be noticed from the full cross section, illustrated, a duct is located below the roof, extending the entire length of the car and being used as an air duct, also containing lamps for the indirect light. This duct acts as an effective compression member. It will be noted that the underframe portion of the cross section is an I-beam built up of extruded metal and truss bracing. This, due to its shape and connections, forms an effective tension member which co-ordinates with the compression member in the roof.

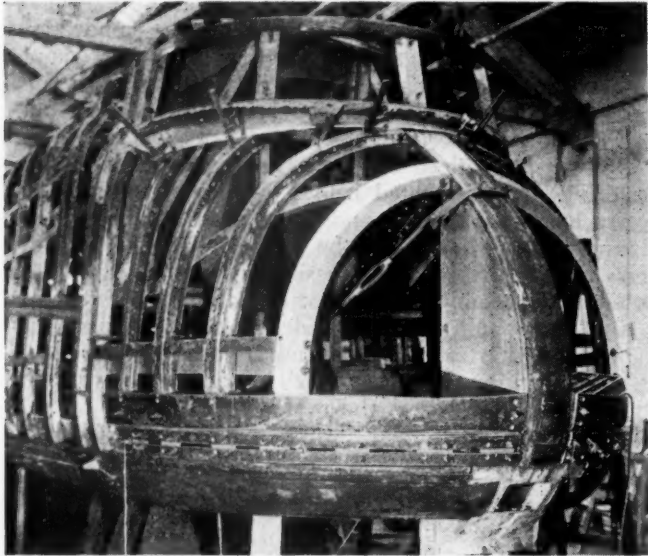
Moreover, the tubular design, which lends itself to



A Front-End View of the New Union Pacific Train

economy in material requirements, also conforms to the best shape as developed in connection with streamlining, reducing materially the retarding effect of side or quartering winds. It has been determined that a quartering wind confronting the train from either side actually offers the greatest resistance because of the larger surface area presented to forces present in the air current.

Whenever light-weight equipment has been proposed, the usual reaction of experienced railroad men is to stress the hazard encountered at grade crossings when colliding with automobiles, trucks, etc. In order to protect against damage under such conditions, the front end or nose of this train was given special consideration. About half of the total weight of the train, or 85,000 lb., is carried on the front truck, which necessarily requires a massive support for the engine at the floor line. This floor line construction forms the center of the curved front end, and all of the structural members converge to form a strong parabolic arch, which should



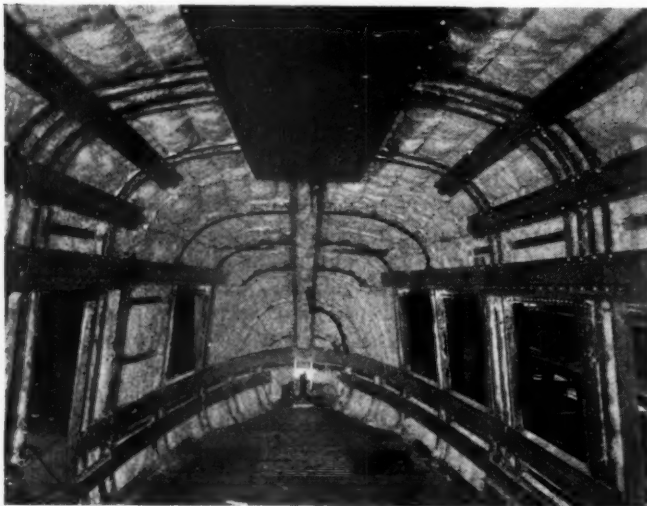
Typical Massive Aluminum Framing Construction at the Front of the Train

resist without damage the shock of any collision possible at highway crossings.

Articulated Construction of the Car Bodies

Articulation between body units of the train was adopted as best suiting the requirements for high-speed and smooth riding. It eliminates the objectionable overhang of non-articulated cars, also the necessity for couplers and draft gears and complicated vestibule arrangement. It prevents, except to a limited degree, the independent oscillation of each individual car, thus tending towards a gliding motion of the entire train. It also permits of carrying three cars on four trucks in place of six trucks, thus reducing track resistance as well as inspection and maintenance, and, incidentally, construction cost and weight.

Articulation is effected by attaching an extension steel casting to each adjoining end sill, these castings terminating in center plates which rest one on top of the other. The two center plates in turn rest on the truck center plate. These special castings are made of Hystastic steel, furnished by the American Steel Foundries. All center plates are lined with Oilite bronze to reduce friction. Side bearings spaced on each side of the center

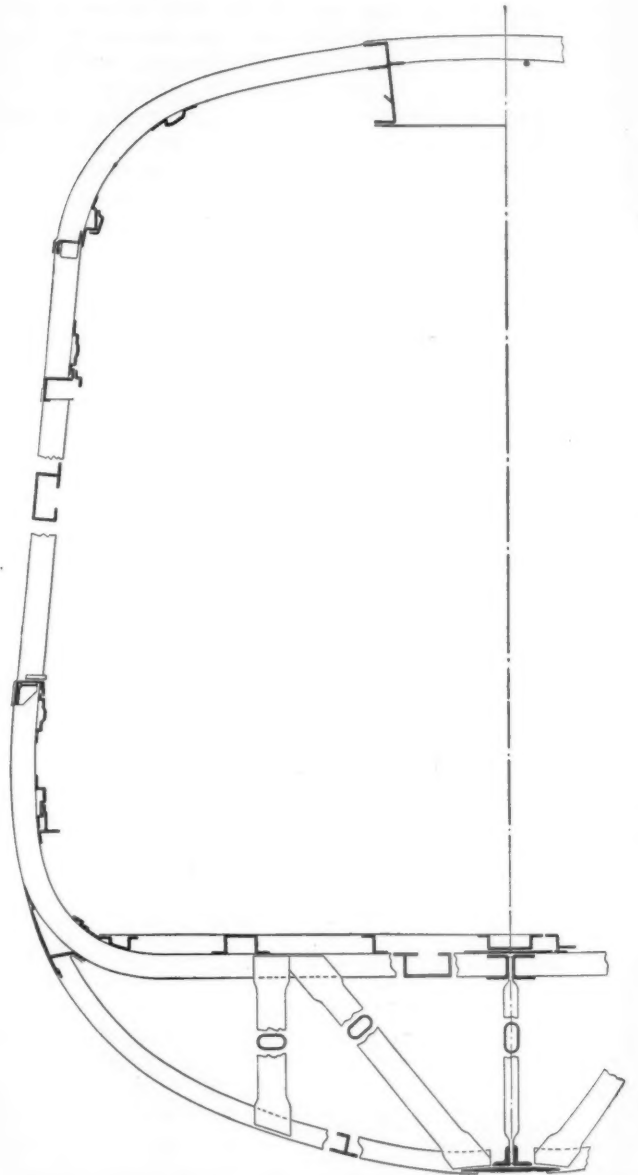


Interior View Showing Car-End Details, Including the Application of Rokflos Insulation

plates are of special design, incorporating the use of rubber in shear, to deaden oscillation and contribute their share toward smooth riding. Conditioned air is transmitted through the articulated connection between the cars by means of flexible bellows, furnished by E. I. Du Pont de Nemours & Co. The usual electric trainline connectors are provided between the cars, and air and water lines are carried in metallic hose through an insulated telescoping tube construction.

Truck Design Involves Extensive Rubber Cushioning

All trucks are of the four-wheel type, with Commonwealth cast-steel frames made by the General Steel Cast-



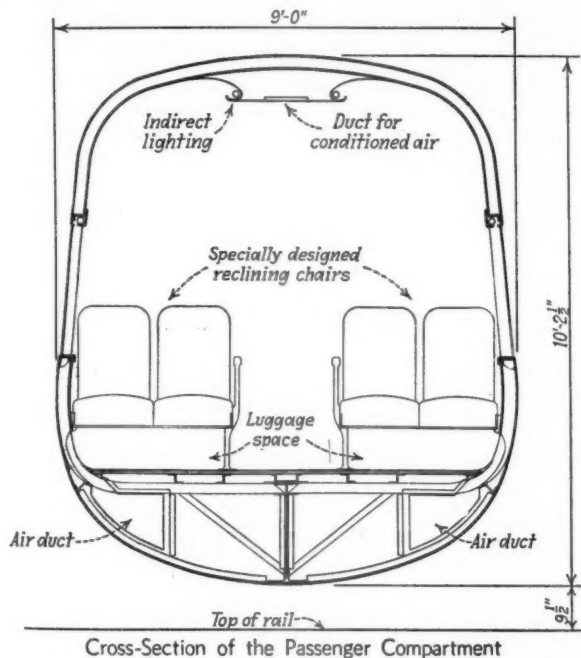
Cross-Section of Framing, Showing Various Extruded Sections Used for the Structural Members

ings Corporation, and rolled-steel wheels and axles furnished by the Illinois Steel Company. The front or power truck has 36-in. wheels, equipped with S K F roller-bearing journals, placed outside of the wheels in order to provide space necessary for the two motors geared one to each axle. The armature shafts are also on roller bearings, the armatures being wound for a safe maximum speed of 110 m.p.h. The remaining three trucks have 33-in. rolled-steel wheels and inside-type S K F roller-bearing journals to reduce the truck

width and minimize air resistance. All roller bearings are liberally oversize for the weight and speed requirements of this train.

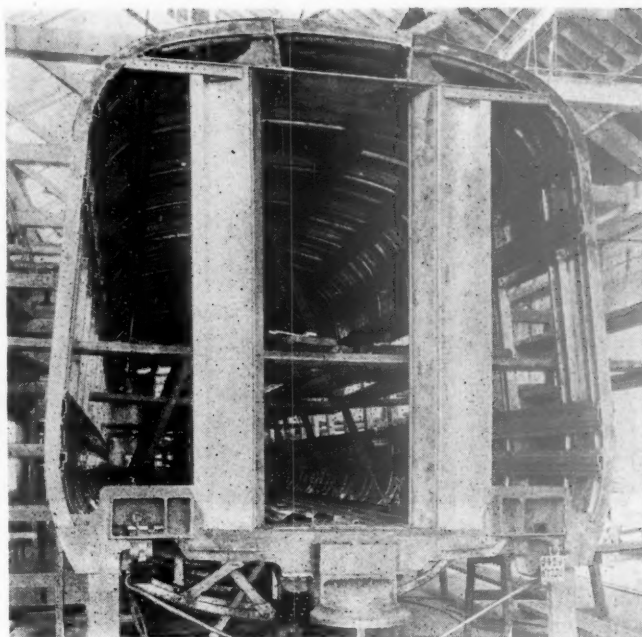
An intensive study was made of the basic requirements for a truck suitable for service with a train of this type. The Pullman Car & Manufacturing Corporation, by the use of extensometers and deflectometers, made a study of truck action to obtain a true basis for correct design, resulting in low uniform deflections in connection with low uniform stresses for all parts of the structure. This insures, under dynamic conditions, the same safety as is indicated by the usual calculations covering static loading. The truck structure, made with the frames and transom cast in one piece, was designed by the General Steel Castings Corporation in collaboration with the Pullman Car & Manufacturing Corporation. An alloy cast steel was used, having a minimum yield of 50,000 lb. per sq. in. and of high ductility.

The truck design is based on extreme cushioning by means of rubber, furnished by the United States Rub-



ber Company, which is arranged to take the dynamic rather than the static loads. There is no metallic contact between the journal box and the truck frame. Two wing castings, which in effect are a part of the journal box, extend out from the box in each direction, one on each side of the frame and parallel to it. Between these wing castings and the frame, both in front of and behind the axle, are rubber doughnuts, applied with sufficient compression so that the rubber has capacity in shear to take its part in supporting the load on the truck. The doughnuts keep the wing castings from contact with the side frame and control both the longitudinal and lateral motion of the journal box with respect to the frame. Acting in parallel with the rubber doughnuts are coil springs placed between the outer ends of each pair of wing castings and the side-frame member. For ordinary static loads only a small proportion is borne by the rubber doughnuts, amounting to not more than about 8 lb. per sq. in. on the rubber. The major portion of the static load is borne by the coil springs, but the load curve of the rubber doughnuts is such that for impact or live loads the greater portion is taken by the rubber.

The swing hangers do not have an exaggerated angu-



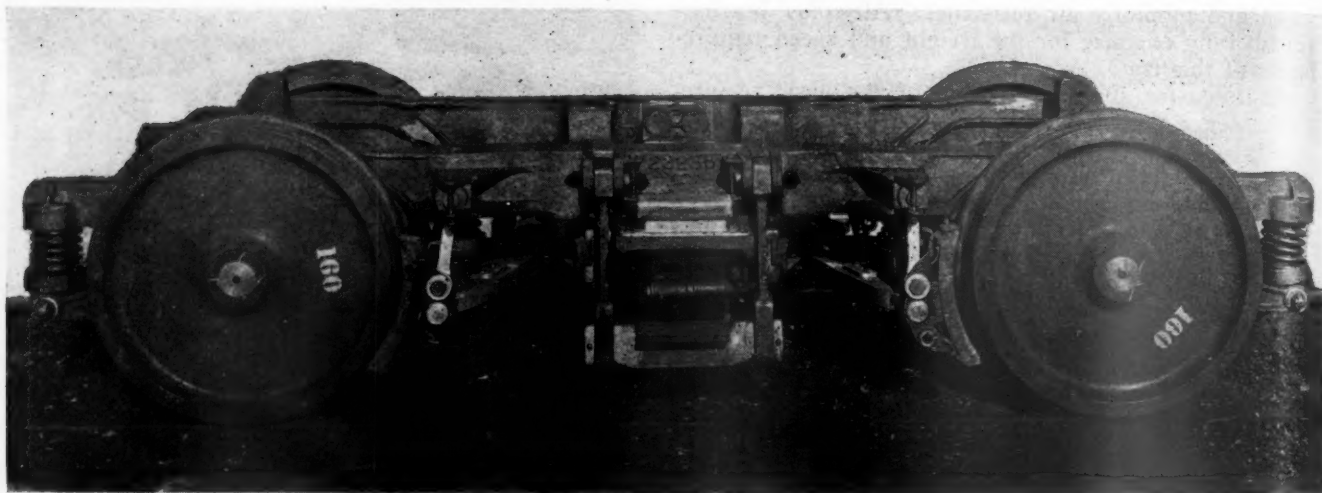
Aluminum Framing Details and Integral Hylastic Steel End Sill and Articulation Casting

larity, so small inequalities in the track can be readily taken care of by lateral motion without any great resistance. Extreme lateral forces are taken care of by Lord rubber bushings which regulate the movement and resistance of the bolster laterally so as to parallel the effect of the swing hanger angularity or gravity resistance after a slight movement of the bolster has taken place, and to greatly augment this resistance for extreme forces. The delayed action of the rubber lateral motion device is such that the ordinary gravity return is not reinforced by the rubber return, as this action is a delayed one and takes place considerably later than that produced by gravity itself.

The chafing plates ordinarily used between truck bolster and transom are present, but are not rigid. A small



View Showing the Passageway Through the Articulated Connection between the Cars



One of the Trailing Trucks

amount of movement is provided by rubber packing to cushion the movement due to acceleration and deceleration. All coil springs are mounted on rubber pads especially designed to soften the shocks and "kill" metallic contact.

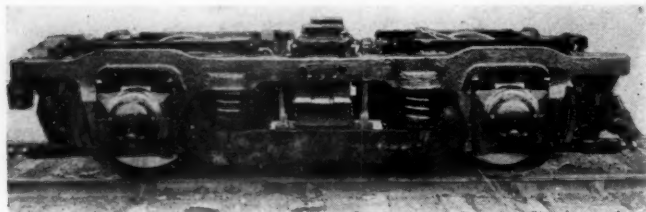
The side bearings are box receptacles mounted on the truck bolster and provided, as mentioned, with rubber in shear to cushion the fore and aft motion, also all vertical motion of the car bodies when rounding curves or encountering track inequalities. With this design, the side bearings are always in contact, with due provision for cushioned and controlled lateral motion.

The truck brake rigging is of clasp brake construction on the motor truck. Brake cylinders are truck-mounted, and the truck application is such that each axle is braked separately by its own cylinder without connecting the brake rigging between the two axles. The truck cylinder pressures, however, are equalized. All brake shoes are of the unflanged Diamond S type, furnished by the American Brake Shoe & Foundry Co.

On the trailer trucks, due to the limited weights on the trucks, the single shoe per wheel brake system is installed. As in the case of the power truck, each pair of wheels has its own brake system, with the cylinder truck-mounted. The truck brake rigging on all trucks is designed so that the application pressure of the brake shoe is independent of the action of rubber between journal box or wings and truck frame. Where possible, aluminum has been used for brake rigging parts, brake cylinders, also for valves and all piping. It is interesting to note that the weight of the entire air-brake equipment on this train is only 608 lb. for the power car, 179 lb. for the second car and 283 lb. for the third car.

Details of the Power-Plant Installation

The power plant in this train, including the engine, electric transmission, controls, etc., was designed and supplied by the Winton Engine Corporation, Cleveland, Ohio, a division of the General Motors Corporation.



The Power Truck of Commonwealth Cast-Steel Construction, S K F Roller Bearings and a Special Spring Suspension

The prime mover is a 12-cylinder, V-type engine, with 7½-in. by 8½-in. cylinders, rated at 600 hp. at 1,200 r.p.m. The entire rated horsepower is said to be available for propulsion of the train, the engine delivering sufficient horsepower in excess of the rating to provide power for all train auxiliaries, such as cooling fans for the power plant, air-conditioning, lighting, etc.

The engine was designed primarily for this train and incorporates some features not heretofore used. It is designed to utilize the Duff system of distillate burning

General Dimensions of the Winton Model 191-A Distillate-Burning Engine

Horsepower rating	600 hp. at 1,200 r.p.m.
Number of cylinders	12 cylinders, 60-deg. V-type
Bore and stroke	7½ in. by 8½ in.
Crankshaft	Special counterbalanced
Main bearings	Seven, 5½ in. diameter—High lead bronze
Pistons	Aluminum alloy
Connecting rods	Drop forged
Rod bearings	Twelve, 4¾ in. by 3 in.—Babbitt
Engine block	Fabricated steel
Crankcase	Fabricated steel
Cylinder heads	Individual cast
Exhaust valves	Dual; diameter 2¾ in.
Intake valves	Dual; diameter 2¾ in.
Valve tappet adjustment	Automatic
Cam shaft	Integral cams, hardened and ground
Cam-shaft bearings	Seven; line bored; 3¾ in. diameter
Cam-shaft drive	Flexible chain, automatic adjustment
Engine auxiliaries	Mounted on gear case; spline drive
Mechanical governor	
Dual oil pump	
Quadruple ignition	
Large-capacity water pump	
Carburetion	Duff
Engine lubrication	Forced feed throughout; crankcase supply

which is standard on the Union Pacific System. Special features in the engine design include a cylinder block and crank case made entirely of rolled-steel plate welded into one piece by the Lukenweld process. The main framework of the engine is, therefore, one solid piece, to which a light oil pan, cast-iron cylinder heads and other accessories, are attached. Cylinder liners are of hard cast iron, pressed into the welded steel framework and readily replaceable.

The wearing parts of this engine are readily replaceable, thus promoting long engine life. Cylinder heads are of cast iron with valves in the head. There are two exhaust and two intake valves and four spark plugs in each cylinder head. The cam shafts are located on the outside upper corners of the main framework, and the Duff distillate carburetors are mounted on the outside of the V-type cylinders. The exhaust connections have an individual pipe for each cylinder and are taken off vertically upward at the inside of the V.

Accessories, which include a double lubricating oil pump, water pump, governor, hydraulic relay for throttle

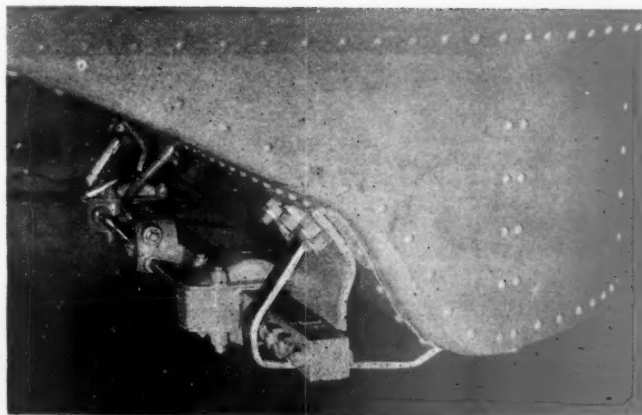
control and four ignition distributors, are mounted on the end of the engine farthest from the generator. These accessories and the two cam shafts are driven from the crankshaft by a roller chain. The engine drive to the generator is through a torsionally flexible coupling.

The pistons are of aluminum alloy and the connecting rods are H-section drop forgings of alloy steel. The connecting-rod big-end bearings are cast directly into the rods. The main bearings of the crankshaft are removable liners.

The electrical equipment, consisting of a generator, traction motors and control, were designed for this particular power plant. The generator and control apparatus were manufactured by the Westinghouse Electric & Manufacturing Company, while the traction motors and air compressors are of General Electric Company manufacture.

The generator, rated at 425 kw., is directly connected to the engine. This generator carries a built-in exciter so designed that the current demand of the traction motors regulates the amount of generator voltage in such a manner that the load on the engine is constant at any car speed, and solely under control of the engine throttle. The two 300-hp. traction motors, mounted on the front truck and geared to the wheels, are of a new, roller-bearing type, incorporating features of design necessary for the high speeds at which this train will operate. Cooling air for the traction motors is carried to the motors through a special air-cleaning and ventilating system which assures air being forced through the motors at all times.

The streamlined characteristics of this train necessitated the development of a cooling system which differs radically from the conventional type heretofore used on motor cars, as it was no longer possible to locate them on the roof of the car. The system developed for this car provides for the radiators being located below the engine-room roof. Air is brought in from the front of the car through a duct, as far as the partition dividing the engine-room from the operator's cab. At this partition, two fans, driven by the engine, force air into the engine-room under sufficient pressure to pass it out through the radiators. This treatment of the air assures a minimum disturbance of the air stream past



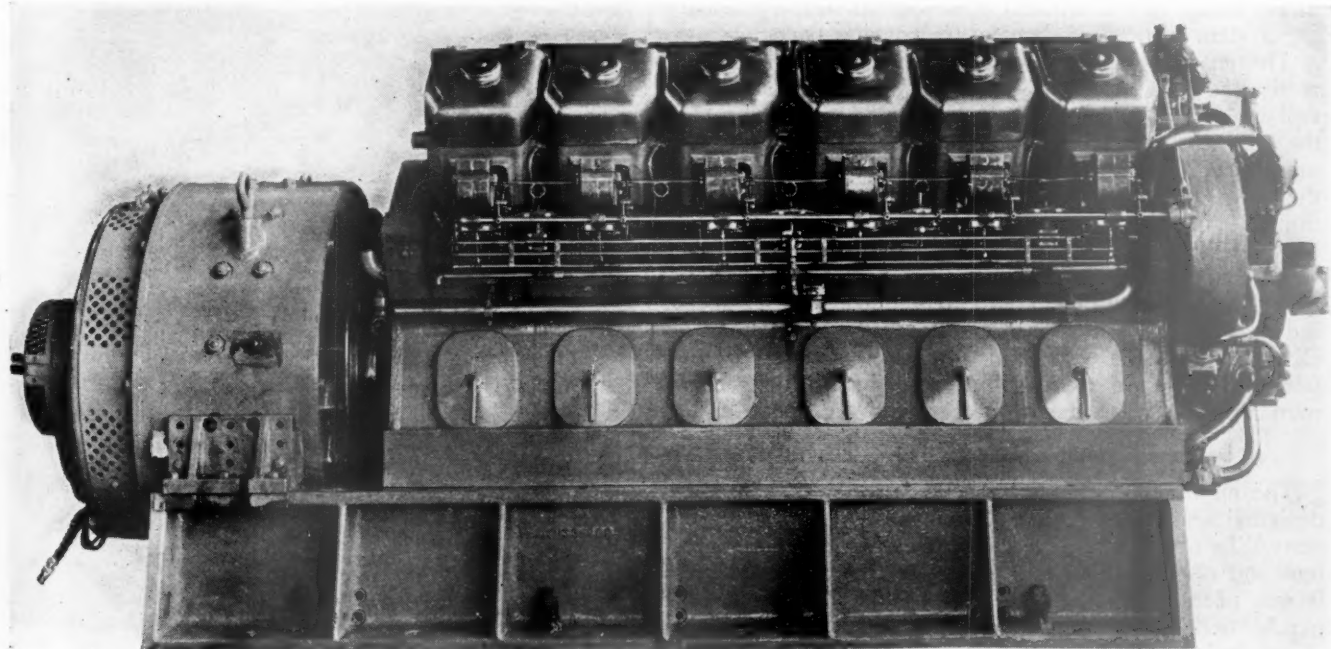
Cab Signal Receiver Mounted Behind the Protective Apron and Just Ahead of the Front Wheels of the Power Truck

the train, a thoroughly-ventilated engine-room, a cooled exhaust manifold and an immediate dilution of exhaust gas as it leaves the exhaust stack.

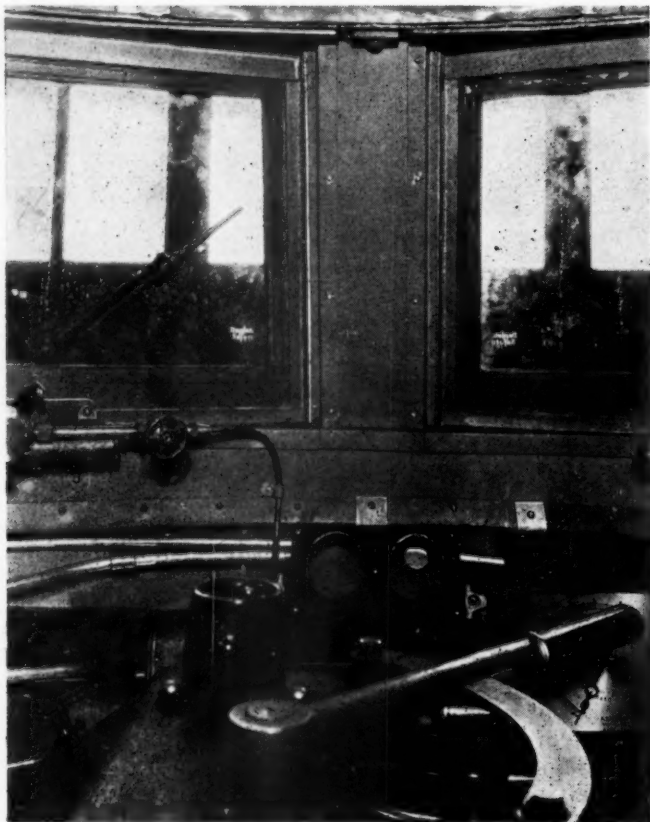
The water for the engine-cooling system is kept in a tank in the rear of the engine-room and in the engine jackets themselves. Thus, when the engine is stopped, the water drains from the radiators into this tank, affording protection against freezing in cold weather. A feature of the engine cooling system is its freedom from excess piping.

Fuel is lifted from the fuel tanks to the carburetors by means of a motor-driven fuel pump, with a return system for returning excess fuel to storage tanks. The Exide-Ironclad MVAH-17 storage battery, furnished by the Electric Storage Battery Company, consists of 32 cells arranged in two groups of 16 cells each, connected in series and furnishing current at 64 volts, the voltage of the lighting and auxiliary power circuits.

A special auxiliary generator of Winton design, driven from the end of the main generator shaft and having a maximum capacity of 25 kw., is used for charging the storage battery, which in turn provides power for all control, car-lighting, ignition, heater, motors, pumps, air-conditioning, etc. The voltage of this auxiliary generator is constant at all speeds, including



Winton 600-Hp., 12-Cylinder, V-Type Engine, with Direct-Connected Westinghouse 425-Kw. Generator



View in the Operator's Cab Showing Control Mechanism, Air-Brake Cage, Two-Indication Type Cab Signal, Window Wiper and Safety Glass

idling. A $7\frac{1}{2}$ -kw. Kohler engine-generator set, mounted in the baggage compartment, furnishes power for battery charging, heating, cooling and lighting when the main engine is shut down for any extended period.

The lubricating oil for the engine is supplied by a twin-gear pump which is a part of the engine. One section of this twin pump takes oil from a storage tank and delivers it into an oil passage in the cylinder block, from which it is carried to every working part of the engine. The pressure in this oil passage is used to open the engine throttle so that the engine cannot be operated above idling speeds without sufficient oil in the lubricating system to prevent damage to working parts.

The engine control consists of an engine throttle directly under the operator's hand. The transmission control consists of a master controller located directly under the engine throttle. This master controller directs the movement of electric and air-operated contactors and the reverser controlling the connections to the two traction motors for forward and backward motion of the car.

In the operator's compartment are located the various gages, such as air brake, engine temperature, G. E. speed indicator, etc., so that the operator may be familiar at all times with the exact functioning of all parts of the power plant. An electric buzzer system affords communication between the train crew and the operator.

Brake Equipment Includes Novel Features

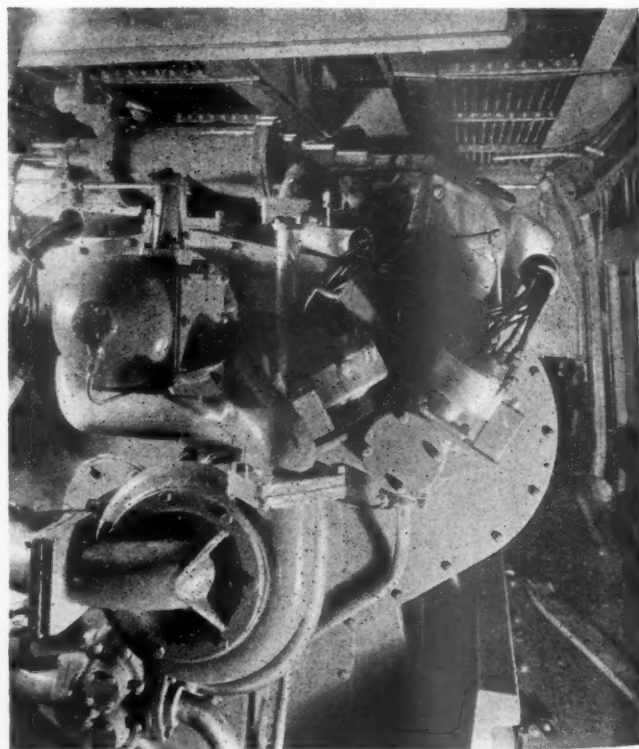
The air-brake equipment for this train was especially designed and built by the New York Air Brake Company. In order to avoid rearranging the signaling system and also to avoid any additional operating hazard, it was necessary to be able to stop this train from 100 m.p.h. within the same distance that a conventional steam train could be stopped from the ordinary speeds at which it operates.

Heretofore, uniform braking retardation has not been possible, due to the fact that the coefficient of friction between brake shoes and wheels varies with the speed through a wide range, this coefficient decreasing rapidly at the higher speeds. In order to provide a uniform rate of retardation, it is necessary to control brake-shoe pressure automatically in proportion to the speed. In the new brake, this is done by automatically controlling cylinder pressure by a simple but effective device recently developed and thoroughly tried out, and known as a "decelerometer". This instrument consists essentially of a movable weight of about 100 lb., sensitively mounted on ball-bearing rollers and arranged to move in the line of motion of the train, and suitably restrained by a calibrated spring. This weight, acting through suitable leverage and a pneumatic valve, controls the brake-cylinder pressure accurately in proportion to its inertia, and, therefore, in proportion to the retardation of the train. Recent tests with this device on a gas-electric motor car developed a straight line retardation graph from 76 m.p.h. to rest.

With high rates of deceleration up to the point at which the vehicle comes to rest, the sudden change from high deceleration to a state of rest would result in a noticeable jolt at the end of the stop. In order to eliminate this, the decelerometer is provided with an ingenious valve device which changes the rate of deceleration to a low value just previous to the stopping of the vehicle. This results in a sudden final reduction in cylinder pressure to prolong the smoothness of deceleration to the end of the stop.

The decelerometer control is designed to assure stopping distances from exceptionally high speeds shorter than are obtained on steam railroad trains running at much lower speeds, without the slightest discomfort to the passengers and providing insurance against slid-flat wheels.

The air brake used on this train is a complete departure from conventional practice, both in its circuit and the individual design of the various valves and parts



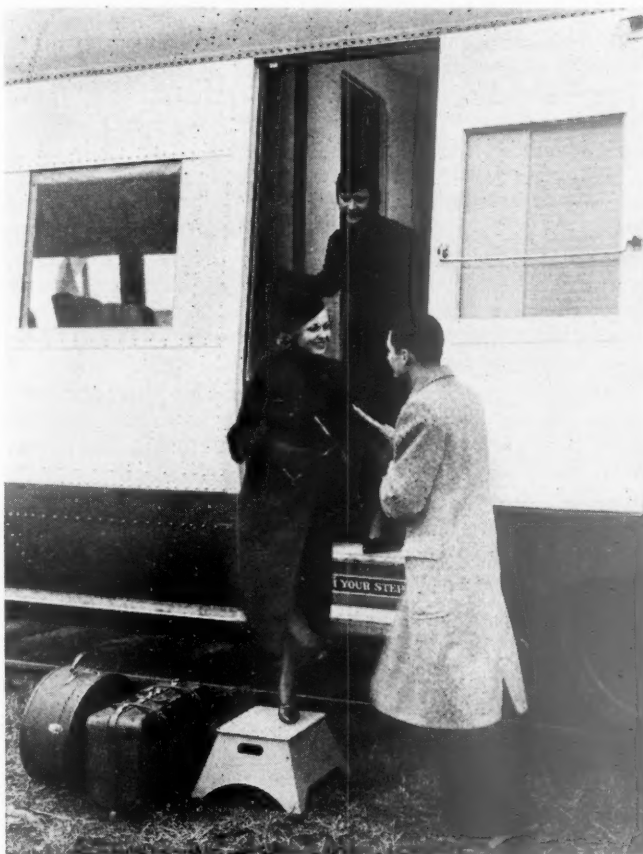
Engine-Room View Showing Accessories Mounted on the End of the Winton Engine

used. The pneumatic feature is based on a two-pipe circuit consisting of a supervisory line and a control line. The supervisory line distributes the air to the reservoirs under each car and charges to the maximum pressure at all times. In conventional brakes, it is not possible to charge the reservoirs during brake application. The purpose of the control line is to apply and release the brakes by admitting air to the pneumatic relay valve under each car, this valve controlling communication between each brake cylinder and its adjacent reservoir, and from the cylinder to the atmosphere. This control line passes from the operator's brake valve through the decelerometer valve to the relay valve. This briefly describes the pneumatic operation. Parallel to this pneumatic circuit lies an electric circuit actuated by contact points on the brake valve, which operates a magnetic control feature on each pneumatic relay valve. This not only synchronizes but accelerates all brake applications and releases.

The use of a straight-air brake system demands adequate protection against operating failures in case of pipe rupture or other unforeseen causes. To overcome this, the relay valve units are so constructed as to insure proper operation upon the depletion of pressure from both the supervisory and control lines. If the electric circuits should fail from broken lines or other causes, the pneumatic elements in the system will function in the usual manner to supply adequate braking power.

Air-Conditioning and Ventilation

An air duct is carried throughout the train on each side below the floor line, and there is also a central ceiling duct throughout the train, all of these ducts being connected between the cars by flexible bellows. Heat is obtained by passing air through the radiators of the engine, this air being forced by blowers through the floor ducts, there being a radiator outlet at each seat. Air is exhausted through a corresponding opening in

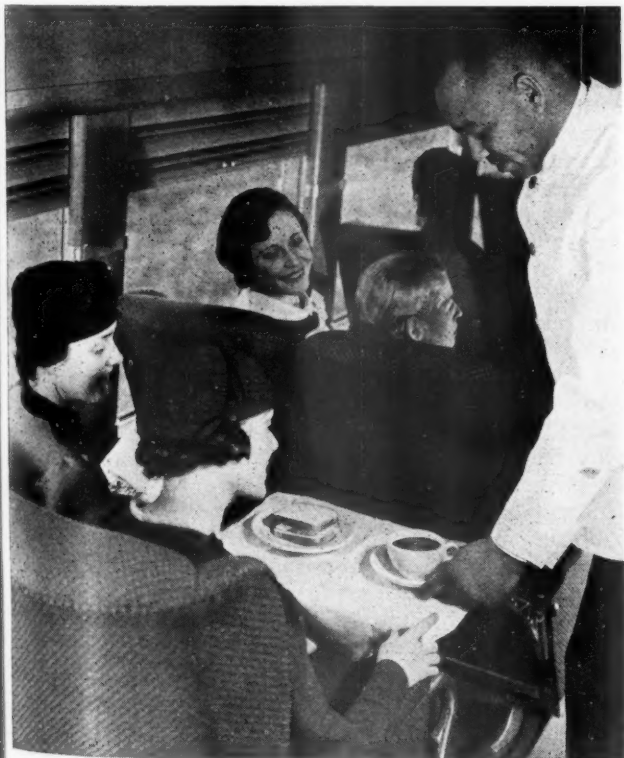


Easy Entrance or Exit Is Provided by Coach Side-Door Steps which Are Folded Up While the Train Is in Motion

the ceiling duct so that a definite circulation is obtained at each seat unit.

Two oil-fired hot-air furnaces, supplied by the Vapor Car Heating & Lighting Co., are installed, one on either side of the baggage compartment, being designed to heat the train under all conditions, should there be a failure of the heat from the engine radiator. They also provide heat for the cars at terminals or in the yards when the engine may not be operating. These oil-fired heat-generating units weigh 580 lb. each and, at a rate of 1,250 cu. ft. per min., have a capacity to deliver up to 135,000 B.t.u. per hr. The overall dimensions of each complete unit, as installed, are 19 in. wide by 40 in. high by 38 in. long, including the floor space required for the oil burner. Each complete unit comprises a combustion chamber, special radiator, or heat exchanger, smoke hood with stack switch and smoke stack with draft adjuster, and the oil-burner equipment. This gun-type burner, with electric ignition and directly-connected pump and fan, is arranged for burning distillate oil at pressures from 80 to 160 lb. under the control of an adjustable pressure-regulating valve. Adjustments of both the oil pressure and the air supply are easily made while the burner is in operation. The burners are designed to operate with either d.c. or a.c. current and, in the former case, have motors which also generate a.c. current, stepped up by a transformer to approximately 10,000 volts for ignition purposes.

Heating thermostats are provided, one on each side wall of the second car, with three tubes each for low, medium and high temperatures, controlling the operation of the oil burners for the corresponding side of the train. A thermostat on the switchboard locker side of the car contains an additional tube which automatically controls the motorized dampers, admitting heat from the



Close-Up View of Car Seats and Table Attachment for Serving Light Meals

engine-room. Temperatures are similarly controlled in the mail compartment of the first car and also in the third car. All heating thermostats operate through relays mounted on a control panel located in the baggage compartment of the first car; and these relays, in turn, operate either the motorized dampers or oil burners.

The air-cooling system, with a refrigeration capacity equivalent to the production of $7\frac{1}{2}$ tons of ice in 24 hours, is an adaptation of the Pullman mechanical system to the special requirements of the U. P. three-car train. A Freon compressor, made by the General Refrigerator Company, Beloit, Wis., is driven by a direct-connected Louis Allis 12-hp. d.c. motor. This power unit, together with necessary air-cooling equipment, is installed in the baggage room. For cooling the cars, the direction of circulation of the air is simply reversed from that used in heating, the cold air being discharged from the central ceiling duct and exhausted through the two floor ducts, shown in one of the illustrations.

A cooling thermostat is located on the side wall of the second car, with three tubes for low, medium or high, controlling automatically the operation of the cooling compressor. This cooling thermostat also operates through a relay mounted on the control panel.

General Method of Insulation—

Safety Glass in the Car Windows

An important factor in the maintenance of satisfactory temperatures in this train is the type of insulation installed, and this question was given careful consideration by the designers. The entire train is insulated with a two-inch thickness of Rokflos insulation, furnished by the Union Asbestos & Rubber Company. This material consists of a white mass of long, fine mineral fibers, closely interwoven to the required thickness and backed on both sides with an all-asbestos open-weave cloth. This type of insulation was selected on account of its notably light weight, high insulating value and sound-deadening properties, together with the fact that it also possesses the other important requirements of being permanently

fire-proof, water-proof and vermin-proof. Rokflos insulation was applied on the floors, sides, ends and roofs of the cars and held in place by small-diameter wires running lengthwise of the car. This material was also used for insulating all of the air ducts in the train.

The floors of the cars are of aluminum alloy plates, built into and forming a part of the structural work of the cars themselves. These plates in turn are covered with Magnesite, a composition flooring, on top of which the final flooring of cork tile is laid. The cork tile, in natural colors but of light and dark shades, lends itself admirably to the comfortable appearance of the interiors of the cars. The composition flooring and the cork tile form a part of the general insulation of the cars and are an important aid in the reduction of sound from train operation.

To provide an additional safeguard for the passengers, all coach windows are made of Duplate safety plate glass, $\frac{7}{32}$ in. thick, manufactured by the Pittsburgh Plate Glass Company. Duolite, another product of this company, is used for all transom lights. As the name implies, Duplate glass comprises a laminated construction, in which two plates of especially-selected plate glass are joined under a hydrostatic pressure of about 190 lb. per sq. in. and a temperature of 250 deg. F. to a plastic filler which forms a bond to hold the glass together in case of rupture. The glass is manufactured under a formula which makes it not only shatter-proof but keeps out sunlight glare by the exclusion of ultra violet rays. As a result of extensive research and experiment, Duplate has been developed to a point where it is said to retain its safety features over long periods without appreciable deterioration. Sample plates of all glass used in the U. P. three-car train were subjected to the impact test, boil test, baking test and light-transmission test before installation.

Interior Decoration, Lighting and Seating

The interior design and decoration are simple but striking, developed by Sterling B. McDonald, art director for Karpen Bros., Chicago, in conjunction with the Pullman Car & Manufacturing Corp. A passenger walking down the aisle toward the buffet is impressed with the ingenuity of the architectural design which gives the compartment the appearance of an entirely separate section of the car. This is accomplished by a bulkhead construction that blends into the general interior decorative effect of the car. This bulkhead begins immediately above the center, on either side of which are illuminated glass cases for the display of cigars, cigarettes and fruits. Over the grille is a special canopy with exhaust fans which prevent any odor of cooking penetrating the car.

The interior color scheme is blue, shading down progressively from nearly white at the top of the vaulted ceiling, through the lighter shades of blue to a dark blue color below the window sills. The colors are all metallic. Horizontal lines of aluminum show between the different shades of blue. The trimming on the chairs is of aluminum. The window sills are Micarta, a black Bakelite furnished by Westinghouse. The chairs are upholstered with a golden-brown tapestry, made by Wm. Wiese & Co., New York. The curtain rollers are entirely concealed, and the curtains, themselves, are of Venetian blind design, with fabric made by the Orinoka Mills, New York. The tile floor is covered with a harmoniously colored carpet aisle strip.

The 64-volt lighting system is entirely indirect, the electric globes being concealed in the aluminum panel construction running the entire length of the ceiling



Interior View Showing the Seating Arrangement in the Cars

of the cars. The light is uniformly reflected on each side against the ceiling cove which has been properly curved, so that, in combination with the color scheme, the illumination is evenly distributed at the reading position. The lights are so arranged that three intensities are obtained, the lowest intensity being for night lighting while passengers are sleeping.

The car seats were especially designed by the Pullman Car & Manufacturing Corp. for this equipment, the aim being to secure the maximum of comfort, together with style and attractiveness. While the seats are arranged in pairs on either side of the aisle, each seat is an individual unit and may be reclined without reference to that adjoining. The seat backs are adjustable to three positions, the lowest being especially comfortable for sleeping. A footrest adds to the comfort of the passenger.

The seats are equipped with devices for quick installation of an individual tray for each seat at the proper location for the service of meals from the buffet or for use as an individual writing desk. Ash trays are placed at each seat for the convenience of those who desire to smoke. The space beneath the seats is kept clear to provide storage space for baggage, the overhead baggage racks of the conventional train having been eliminated. At either side of the aisle in the forward end of each car, the seating arrangement provides facilities for those who desire to play cards.

Buffet Service Provided

A novel feature of the new train is the buffet kitchen which is built into the end of the last car of the new train. Triangular in shape, the buffet, though small, is nevertheless replete with space-saving devices to render complete service for the preparation of light meals. Stainless steel, furnished by the Allegheny Steel Company, is extensively used in this buffet. A Stearnes oil-burning range is provided. Across the front of the buffet is a counter from which drinks can be served. On one side is a refrigerated box for carrying ice creams, cooling refreshments, etc. On the other side are two coffee urns, a grill and other cookery apparatus. The electric ice box, provided with General Electric mechanical-refrigeration equipment, is built directly into the end of the car.

The passengers are served at their seats in the cars. The tray and table, when not in use, can be folded compactly for storage. The same supports and trays can also be used by the passenger as a small writing desk at the seat, if desired. In the service of meals, the waiters pass through the aisle with what is, in effect, a tea wagon with a steam table top and lower shelves for dishes, silverware and linen of a special weave.

The dishes on the new train are themselves worthy of note. Blue and yellow are the color motifs of the service, but the dishes, instead of being of china are made of the latest development in such ware. They are a special composition of the sort known as Beetleware, light in weight, graceful in design and colorful in appearance. The new train has the distinction of being the first train in America to employ this sort of service for meals. It is noteworthy that the total weight of the dining service of the new train, namely, the dishes, cups, saucers and glasses, aggregates only 189 lb., which may be compared with 530 lb. for the usual china service of a conventional train.

An auxiliary ice box for the storage of natural ice is arranged behind the electric refrigerator, the auxiliary supply being additionally available for refrigeration while the train is in terminals.

Two wash- and toilet-rooms are built into each car,



Completely Equipped Buffet in the Rear of the Third Car

these being located in the ends of the cars. The most modern type of sanitary equipment and fittings are installed. The wash-stands are of white metal. In the women's wash-room, there is a large built-in plate-glass mirror and dressing stand. Wash-stands and toilet-rooms are also installed in the first car of the train for the use of members of the crew.

Special Headlights—Cab Signals Installed

The double-beam headlight used on the Union Pacific streamlined train was developed by the Pyle-National Company, Chicago, to conform to requirements of the railroad. It comprises both horizontal and vertical light beams, the horizontal headlight performing the normal functions of a locomotive headlight, and the vertical headlight serving as a distinctive marker.

The vertical marker beam will be seen plainly from a distance, and serve to herald the approach of this unusually high-speed unit from a great distance, and more definitely than would be the case with the standard horizontal headlight alone. The vertical beam will be visible off to the sides of the right of way, while the horizontal beam is confined to a comparatively small area forward.

The vertical headlight has a 10-in. silvered glass reflector, and the horizontal headlight a 12-in. reflector of the same type. Both headlights use special 75-volt lamps, the upright light having a 100-watt lamp and the forward light a 250-watt lamp.

The double headlight unit furnished by the Pyle-National Company, comprising reflectors and their mountings, lamp stand, and focusing devices, is completely built in, the housing being formed as a part of the car-roof streamlining of the front end of the train.

The classification lamps shown in the front-end views are likewise built in, the lenses being flush with the streamlining at the front end. These classification lamps are a modification of the Pyle-National air-craft naviga-

tion lights or wing lights. Clear, refracting-type lenses are mounted flush with the skin of the car, without interference with the streamlining. While it would appear that the light beam would point off to the side of the car, the refracting-type lens directs the beam forward, the effect being the same as with a standard classification lamp. These classification lamps are equipped with 5½-in. reflectors, and a movable shutter between the reflector and the lens provides for showing either white or standard green indication.

Marker lamps at the rear end are of the same design, built in flush with the streamlined skin of the car. The lenses of these lamps are standard red instead of clear, and the lamp is without the shutter mechanism, as no change of indication is required.

The train is equipped with cab signals, the same as used on steam locomotives, and these signals will be operative in the territory equipped for cab signaling extending between North Platte, Neb., and Cheyenne, Wyo. The cab signaling is of the two-indication type, furnished by the Union Switch & Signal Company. The signal is mounted horizontally on the front wall near the center of the cab, so as to be within the line of vision of both the engineman and fireman. The cab signal has two indications. The one at the right displays a green aspect when the track ahead is clear for at least two blocks, while the one at the left displays a red-over-yellow aspect when traveling in a caution or occupied block. In addition to these visible indications, an audible signal is provided in the form of an air whistle which starts to blow when the cab signal indication changes from green to red-over-yellow, and continues to blow until the engineman operates the acknowledging switch, located on the right wall of the cab near his seat. The whistle and the magnet for the control of the whistle are mounted below and to the right of the engineman's seat.

The receiver is mounted as usual ahead of the front wheels of the train, and is behind the protective apron. The design of the train made it necessary to shorten the receiver bar by cutting off 4 in. at each end. Likewise, it was necessary to mount the receiver 12 in. above the rail instead of the customary 6 in. In order to compensate for these two changes, the amplification of the voltage picked up from the rail was increased. The equipment box, which contains the amplifier and relay equipment, is in the engine-room, being mounted on the forward wall about 3 ft. above the floor. All conduits are made of aluminum.

No special equipment for shunting the track circuits is provided on this train, it being anticipated that the weight on the front truck will afford a shunt, which, together with the wheels on the six axles on the remainder of the train, will provide adequate shunting.

Co-ordinator's Organization Studies Cost Finding

SECTION 13 of the Emergency Transportation Act requires the Co-ordinator to investigate, among other things, "cost finding in rail transportation." A report of the progress being made with the study was included in Mr. Eastman's report of this week. This matter was considered extensively some few years ago by the Interstate Commerce Commission, and lengthy public hearings were held at which sharp conflicts of opinion developed. Soon afterward the economic de-

pression set in, and further consideration of the matter was deferred. It had become apparent, moreover, the report says, that a method of inquiry akin to scientific research was needed, including tests and experiments.

The Co-ordinator's present inquiry is in charge of John H. Williams, a man experienced in cost finding in other industries, and he is being assisted by C. H. Crandall, one of the leading accountants of the Commission's staff. He is being assisted, also, by an unpaid Advisory Committee made up of three railroad officers experienced in accounting and two non-railroad men who have given much study to cost-finding methods. The committee is as follows: C. E. Betts, general auditor, Atchison, Topeka & Santa Fe; C. E. Hildum, executive vice-president, Lehigh Valley; G. W. Lamb, general auditor, Atlantic Coast Line; Dr. H. S. Person, managing director, Taylor Society; and Dr. J. M. Clark, professor of economics, Columbia University.

All cost-finding plans previously suggested for railroad use were studied at the outset. Upon analysis, the report says, they represent very little other than an expansion of the accounting now in use, were it carried to its logical conclusion. The difficulty with all of them is in prescribing adequate rules for the distribution of expense, the extent and complexity of the work itself, and the terms in which the final results are expressed.

In October, 1933, the Cost Finding Section submitted to the Advisory Committee a rough outline of a plan that seemingly met the above objections. The committee expressed itself as believing the proposed plan to offer better prospects than any other that had previously been developed, and to be well worth trying out. Since then, details of this plan have been worked out, and information for the year 1932 has been assembled from the New York Central, the Chesapeake & Ohio, the Denver & Rio Grande Western, and the Delaware, Lackawanna & Western for the purpose of making a practical test of the plan. These roads were selected because they represent different conditions which should be reflected in their relative costs, and which thus afford a good back-ground in testing the plan. Need for elaboration and further detail will undoubtedly develop in the course of the test.

"The outstanding difference between the proposed methods and those now in use (were they carried to their logical conclusion), and in fact all of those that have previously been suggested," according to the report, "is (a) in the method of converting expense as occasioned into cost of service as rendered and (b) the units in which ultimate costs are expressed."

"(a) Under previous plans, expense as occasioned is divided among the accounts benefiting from the expenditure. This is accomplished through a series of progressive distributions and re-distributions of expense, working from several hundred primary accounts to which the expense is first charged to a few accounts representing major service units. The final result under the proposed plan will be the same in this respect, only in it expense, instead of going through a series of intermediary accounts, will go direct to the accounts representing major services. The purpose in eliminating the intermediary distributions is to simplify the procedure and to keep expense in units as occasioned (for managerial purposes) up to the point of accumulating it in the accounts representing the major services as rendered, from which final costs are compiled.

"Expense is only controllable so long as it is stated in units as expended that can be used in budgeting and for which standards can easily be set. As soon as it is distributed, it passes out of control. There is very limited use for expense in intermediary service units and, on

the other hand, there is necessity for simplification, if cost finding through continuous routine is to be made practical in railroading.

"(b) The principle objection of the railroads to cost finding as previously suggested is that the costs obtained would be in terms of averages which, in the case of a great many commodities, would be below the rates charged. They fear the true significance of average costs will not be understood by the public, and that where they are below the rates charged the difference will be construed as an overcharge and this will create dissatisfaction among shippers which will be hurtful to the railroads.

"Under the proposed plan, it is intended that average costs, when obtained, shall be modified to meet the conditions of the various commodities through the use of a series of modifying factors. These modifying factors will be used in very much the same way as modifying factors are used in the fire insurance business to adjust basic rates to the conditions of individual risks. For example, there is a basic rate for city, country and suburban dwellings and for different classes of factories, stores, etc., and these basic rates are modified according to each particular risk. If a property is located within certain prescribed distances of a paint shop or oil station, there is an additional charge for this fact, and if, on the other hand, it has fire shutters, there is a deduction.

"This is not cost accounting in the ordinary sense of the word, but it must not be confused with an effort at rate making. All of the figures are based on cost and experience. No consideration is given to matters of policy, such as whether or not the business in question tends to create additional business, public interest, what the traffic will bear, etc.

"Present prospects are that the proposed plan will effect a sufficient reduction in the work done by the railroads under the accounting system now in use to offset the additional work required for a complete continuous routine cost procedure.

"Final costs are expressed in terms of rates, not only to dispose of the principal objection on the part of the railroads to cost finding, but because the services rendered by the railroads are charged for in terms of rates.

"Under the proposed plan, all of each item of expense is apportioned to the various service units at the same time and balanced, and any over or undue apportionment to one service will cause an under or over apportionment to some one or more other service units. There is, therefore, little probability of any part of expense being omitted or duplicated, and possible inconsistencies in the basis of apportionment will be brought to light through obvious inconsistencies in the costs for the different units.

"Because the system will be the same for all of the roads and costs will be kept in units as expended, comparison can be made as between all of the roads. If the apportionment of expense as between different units of service is what it should be, the difference in conditions within the different roads will be reflected in their unit service costs. Inconsistencies in this respect will call attention to inconsistencies in the basis of apportionment, which can be corrected. The cost data as between different periods will also be comparable and constitute a further means of indicating possible defects in the basis of apportionment of expense.

"While absolute accuracy in service costs in an industry such as railroading is unobtainable, the costs as determined under the proposed method will all be in the same units and comparable, and any differences as between roads or periods can be easily traced to their

source. The whole procedure is designed with a view to emphasizing the relation between cause and effect, as a means of ascertaining the source of inconsistencies, and the accuracy of the final costs should improve with time.

"The plan will be subjected to the criticisms of shippers, the railroads, and the Commission accounting staff before it is finally recommended to the Co-ordinator."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended January 20 amounted to 560,430 cars, an increase of 4,803 cars as compared with the week before and an increase of 60,876 as compared with the corresponding week of last year. As compared with 1932 it was a decrease of only 1,671 cars. All commodity classifications showed increases in loading as compared with the corresponding week of last year but loading of ore and coal showed decreases as compared with the preceding week. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week ended Saturday, January 20, 1934

Districts	1934	1933	1932
Eastern	128,256	114,239	126,347
Allegheny	110,895	93,082	110,533
Pocahontas	39,829	36,844	35,456
Southern	87,481	79,961	87,503
Northwestern	64,650	56,652	65,183
Central Western	83,154	74,122	88,553
Southwestern	46,165	44,654	48,526
Total Western Districts.....	193,969	175,428	202,262
Total All Roads.....	560,430	499,554	562,101
Commodities			
Grain and Grain Products.....	33,092	27,674	32,558
Live Stock	18,057	17,678	21,048
Coal	126,880	112,639	107,493
Coke	8,342	5,397	5,452
Forest Products	19,647	14,839	19,551
Ore	3,202	2,298	3,469
Mdse. L. C. L.....	160,499	160,242	188,520
Miscellaneous	190,711	158,787	184,010
January 20.....	560,430	499,554	562,101
January 13.....	555,627	509,893	572,649
January 6.....	499,939	439,469	571,678
Cumulative total, 3 weeks.....	1,615,996	1,448,916	1,706,428

The freight car surplus for the last half of December averaged 462,563 cars, a decrease of 7,602 cars as compared with the first half of the month. The total included 264,232 box cars, 140,893 coal cars, 26,195 stock cars, and 11,770 refrigerator cars.

Car Loading in Canada

Car loading in Canada for the week ended January 20 totaled 40,782, which was 7,832 cars above the corresponding week last year, but a decrease of 607 cars from the preceding week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
Jan. 20, 1934.....	40,782	20,463
Jan. 13, 1934.....	41,389	21,015
Jan. 6, 1934.....	34,362	18,791
Jan. 21, 1933.....	32,950	17,941
Cumulative Totals for Canada:		
Jan. 20, 1934.....	116,533	60,269
Jan. 21, 1933.....	92,358	50,006
Jan. 23, 1932.....	119,516	59,494

Can the Railways Improve Their Freight Solicitation Methods?

Is the salesman familiar with his product? Does he understand the merchandising problems of the shipper?

CAN the railways improve their freight solicitation methods? Are their solicitors properly trained? Do they have sufficient knowledge of the service they are selling? Do they understand the patron's merchandising problems so that they can discuss shipping in the light of his needs? Are the traffic departments equipped to provide the necessary information for the solicitor? These are typical of questions that arise in any study of the efficiency of the salesmanship displayed by the railways.

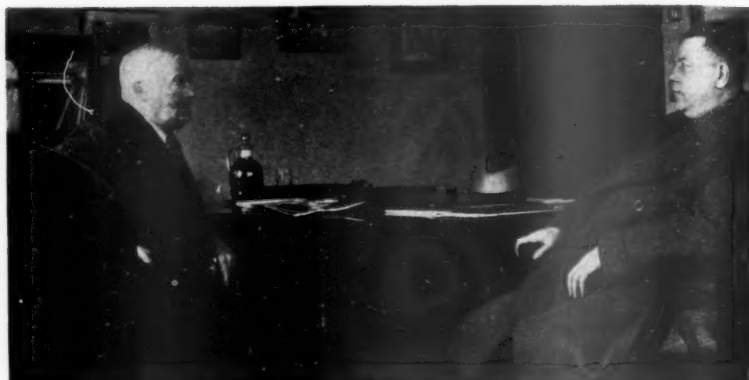
While the same principles apply in the merchandising of freight transportation that arise in selling the more tangible products of other industries, the selling of freight service is more difficult because of the fact that, if done successfully, it requires a thorough knowledge of the many services available and in addition, an understanding of the shipper's business, his markets and the sources of raw materials. Railroad freight solicitors ordinarily acquire their knowledge of their service and the methods of selling it by working in minor positions in freight offices, by association with other employees and by the example set by their superior officers. Most of the knowledge they acquire is secured through their own efforts. Is this type of training adequate to develop efficient salesmen, or should solicitors be given special training in the principles of selling, the product to be sold and other traffic matters?

In any study of selling, the severest critic is the person being sold. In view of this fact, shippers were consulted to ascertain whether freight solicitation can be improved. Replies made by several shippers interviewed as to their opinion of freight solicitation follow:

Some Defects of Solicitation

One traffic manager said, "The majority of solicitors who call on me know very little about the service, arrival time and rates over their own lines and less about routing." Another said, "The average solicitor does not comprehend the merchandising problem of the shipper and, consequently, cannot understand his inter-related traffic problems." A small shipper replied, "Since I have no traffic expert in my organization, I must rely on the solicitor for the proper classification and routing of my shipments. Often I find that the solicitor does not know how to handle the shipment to my advantage or purposely gives me information that increases the shipping costs."

Another traffic manager in replying cited an actual



The Solicitor Should be Qualified to Help the Shipper Solve His Problem

case that happened a few days ago. "We had an order," he said, "for construction material to be used in a new project at a point apparently not on a railroad. Our problem was to determine how the six cars of material could be delivered to the job at the lowest cost and with the least handling. The traffic departments of two railroads were consulted and both contended that the cars would have to be billed to a point three-quarters of a mile from the site of the job and then trucked to the place of construction. We did not accept this advice but sent one of our men to the point to study the conditions for us. He learned that a serviceable spur extended from the railroads to within 50 ft. of the job, that the loaded freight cars could be spotted thereon and that a truck equipped with a crane could unload the cars and place the material at the place where it was to be used. This arrangement was employed and the shipping cost was \$300 less than it would have been if the method suggested by the traffic departments had been used."

In view of these expressions, it is evident that there is room for improvement in freight solicitation.

The railways, during the last few years, have improved their services by speeding up deliveries to meet the trend toward hand-to-mouth buying, by making their services more flexible through the introduction of package and container cars, by adding pick-up and delivery service and by establishing other services which are advantageous to the shipper. However, their methods of bringing the merits of their service to the attention of the shipper and of applying technical data to his problem have changed but little.

Solicitation of L.c.l. Business Weak

One of the most outstanding weaknesses in railroad freight solicitation at the present time is the failure of solicitors to exert much effort to procure L.c.l. business. This is due to some extent to the fact that carload business is more desirable but in many instances it results from the fact that the solicitor does not know what service his railroad is prepared to perform. The Chi-

cago railroads operate 1,900 package cars out of that city each day, but, according to one shipper, the majority of the solicitors cannot name the leaving times, schedules and destinations of the package cars operated by their own railroads.

Another weakness is the solicitor's unfamiliarity with terminal operations and unloading facilities in large cities. Terminal operations affect delivery and are of importance to the shipper, especially in cities where the facilities are extensive. In some cities it is often possible to route freight through terminals so that delivery can be made in from 24 to 48 hr. less time than by way of a more circuitous route. Yet, according to one traffic manager, solicitors cannot supply detailed information concerning the time and method of handling cars and the location of unloading facilities in large terminals. In the opinion of another shipper, 50 per cent of the solicitors in one large center are not familiar with the terminal situation in their own city.

Freight solicitors have many sales arguments that may be used in procuring business. They may cite the advantages of service and cost in shipping over their particular line. They may offer a differential rate either by way of a circuitous rail route or a combination route. They may show how the total freight bill may be lowered by employing certain cartage arrangements. They may explain how delivery may be speeded up through less familiar routings. They may mention special privileges. They may portray an advantage to the shipper through minimum loss and damage to lading. They may assist in the prompt and satisfactory settlement of claims and use their road's record to influence patronage. They may keep the shipper informed as to markets and sources of raw materials for his products with a view to increasing tonnage for their railroads.

Special Types of Solicitation

Because of the volume in which some traffic moves, some railroads have given special consideration to its solicitation and have employed such specialists as live stock, dairy, coal and perishable-freight agents, whose responsibility is the development of those types of traffic. In addition, many freight traffic departments have industrial agents who endeavor to increase freight tonnage by promoting the location of new industries on their lines and by developing those already established, and agricultural agents who develop the agricultural tonnage by encouraging farmers to adopt scientific methods of farming and live-stock raising.

As a result of increasing competition and more exacting demands by shippers, a number of the railroads are studying ways to improve their solicitation methods, either through the training and educating of employees or by the introduction of expedients which are an aid to solicitors. Illustrative of the latter is a compact timetable designed by the traffic department of one railroad and placed in the hands of each of its solicitors, from which the solicitor can determine the exact arrival time of trains when the shipper asks about delivery. Through its use, the solicitor does not have to guess, neither does he have to ask the customer to wait until he calls his office for accurate information.

Another railroad which has been confronted with the keenest of truck competition has been forced to develop a strong solicitation organization in order to hold its l.c.l. business, which comprises a large part of its traffic. The first step taken by this road to sell its product in competition with truck service was to select and train qualified solicitors. The next step was to encourage these solicitors to study the shippers' needs and report their findings to the freight traffic manager in writing

or at meetings held at frequent intervals. As a result of this procedure, over a period of years, this railroad has developed several specialized types of service to meet competition.

Progressive Policies

In order to train the solicitor, actual applications of services to shippers' problems are discussed at regular monthly meetings on this road. In the solicitation of some business, officers of other departments are also called upon for assistance. Illustrative of the thoroughness of solicitation on this railroad is a recent case of a large shipper whose business was desired. After preliminary calls by the solicitor and the freight traffic manager, negotiations reached the final stage. It was anticipated that the shipper would ask many unusual questions at the next conference and that if complete answers were not given, indefiniteness would postpone a decision and jeopardize the results. To guard against this, the master car builder, an operating officer, the chief of the tariff bureau and the officer in charge of stations were called upon to assist. When this group of specialists met with the shipper, his questions were answered authoritatively and the negotiations concluded satisfactorily without further delay. In addition, the

In the Issue of February 17

Advertising, which has proved its effectiveness in the sale of all kinds of products, has never been widely used to stimulate the railways' freight business. There are those who contend, however, that freight service can be advertised as profitably as passenger service, and a few roads have tried it with interesting results. "Should freight service be advertised?" is consequently an open and timely question. It is the subject of the next article in the Traffic Development Series, to be published in the *Railway Age* of February 17.

shipper was impressed with this unusual type of solicitation which, to him, reflected the character of the transportation he was purchasing.

Another railroad has given special consideration to the training of its employees. In order to make certain that its solicitors understand their duties, each is given an outline of what is expected of a salesman. Among the things demanded are the following: (1) Co-operation with the patron in preparing proposals for rate adjustments and assisting in negotiating them, advising them of rate proposals docketed and the disposition of such proposals; (2) keeping the patron and the connecting line representative informed as to schedules in which they are interested and informing the patron of the whereabouts of carload shipments; (3) assisting in handling reconsignments and diversions and in establishing new merchandise car service whenever the volume of traffic justifies; (4) keeping the patron informed of crop and business conditions in the territory served by the company, of contemplated industrial developments or construction programs and assisting him in other ways to find markets for his products or to locate sources of supply; (5) issuing export papers incident to the movement of export freight and handling the collection of the rail toll, ocean charges and incidentals, arranging steamship bookings and obtaining necessary permits; (6) assisting the patron in the preparation of

claim papers covering overcharges, losses or damage and acting as the contact between the claim department and the patron in disposing of claims involving controversy; (7) obtaining warranty bonds covering the guarantee of payment of freight charges.

This outline of the duties of salesmen is designed to serve two purposes. It specifies what is expected from the solicitor and forces him to become acquainted with important traffic matters. In addition, it is made to include extra services which are appreciated by the shipper and facilitates the sale of that railroad's transportation.

Besides outlining the duties of solicitors, this railroad insists that its employees be familiar with the terminals and territories served by the railroad. Prior to 1929, it sent freight solicitors, in groups of four or five, upon educational tours of the system. These tours, at company expense, required six or seven weeks and included all terminals of consequence on the system and principal off-line points. The groups were met at various points by the local representative who conducted them through the terminal and drove them through the adjacent territory. Since 1929, the railroad has discontinued the practice because of the expense, but many of the solicitors spend their vacations visiting freight terminals and facilities.

In conclusion, it is apparent that the most vital factor in selling freight transportation is the ability of the solicitors to discuss intelligently the freight transportation which they have to sell and from the shipper's point of view. This entails a thorough knowledge of railway traffic matters and an understanding of the shipper's merchandising problems, markets and sources of supplies. To the extent that they fall short of this specification, they are deficient in their preparation.

Plans of Pennsylvania for Use of P. W. A. Funds

PLANS of the Pennsylvania for the use of the \$77,000,000 loan which it recently received from the Public Works Administration were outlined by General W. W. Atterbury, president of the P. R. R., in an interview at New York on January 30. Completion of the electrification program so as to permit the inauguration in 1935 of through electrified service, both freight and passenger, between New York and Washington, D. C., will require \$45,000,000 of the \$77,000,000 total; \$17,000,000 has been allotted for the car program which contemplates the construction in P. R. R. shops of 7,000 freight cars. The remainder of the loan's proceeds—\$15,000,000—will be used for 101 electric locomotives. Under the present plan the P. W. A. money will be spent by the Pennsylvania in increasing installments which will approach \$7,000,000 a month as the work nears completion.

In addition to the foregoing the P. R. R., from its own funds, will finance the continuance of work on station improvements at Newark, N. J., and Philadelphia, Pa. and on the tunnels at Baltimore, Md. These are expected to involve the expenditure of an additional \$3,000,000. When completed, General Atterbury said, the electrification program, including terminal improvements, will have involved a total expenditure which "will run pretty close to \$180,000,000." He anticipated that the electrification would earn 4 or 5 per cent more than its carrying charges.

In commenting on the loan General Atterbury stated it to be his opinion that this type of governmental-industry co-operation is necessary in these times, not only for the railroads but for other industries as well. He does not think that normal capital markets will revive until industry again reports profits. The P. R. R., he added, found the government "unusually co-operative" and thus he wished to express his appreciation "of the way the government has assisted." There are no strings on the Pennsylvania, he explained, since the financial plan of the loan is the same as that of any normal banking transaction. "The \$77,000,000 of securities sold to the government are of high grade and are backed by the credit of the Pennsylvania." In addition to the interest at 4 per cent, payable after the first year, there is an amortization requirement.

The first step in the electrification program will be the completion of the work on the New York-Washington line, while construction of the 7,000 cars will begin next week. This latter will give one year's employment to approximately 1,300 shopmen—700 at Altoona (Pa.) and 300 each at Pitcairn and Enola. The program in its entirety, General Atterbury estimated, will produce the equivalent of a year's work for almost 25,000 additional men on the railroad and in industrial plants throughout the country. A total of 45,000,000 man-hours of employment, railroad and industrial, is represented in the project.

Included in the electrification project will be the construction of the overhead catenary system over the 108 mi. of line between Wilmington, Del., and Washington and in the various freight yards and branches; rearrangement of the roadway signaling system and the building of 16 new sub-stations and the installation of additional apparatus in 18 existing sub-stations. Track interlockings and signal locations will be lengthened to provide for the higher speeds attainable under electric operation. P. R. R. telephone, telegraph, and signal wires will be removed from overhead pole lines and placed in underground cables and at several locations station platforms and tracks must be rearranged and bridge structures rebuilt to give greater overhead clearance. In addition, part of the P. W. A. funds will be used to electrify Waverly, Greenville and Harsimus Cove (New Jersey) yards in the New York area as well as the Waverly and Passaic freight line, the New York Bay Railroad, between Greenville and Waverly, the branch from Perth Amboy Junction to South Amboy, the Princeton branch, the Trenton freight yards, the elevated freight tracks through Philadelphia, the Edgemoor yard, near Wilmington, the freight terminals at Baltimore and the Potomac yard freight terminals with lead-in tracks at Washington.

In the car program are included 3,500 all-steel automobile box cars, 500 to be fitted with automobile loaders, 2,000 standard all-steel box cars and 1,500 flat cars. These cars will be turned out of P. R. R. shops on a progressive monthly program, beginning with 360 this month and calling for completion of the entire 7,000 this year. The electric locomotive orders, to be placed in the near future, contemplate the construction of 59 freight locomotives, 28 for passenger service and 14 switchers. The electric passenger locomotives now in service, General Atterbury said, are being operated at speeds of from 75 to 80 m.p.h. and have on the test track been run at 100 m.p.h., a speed which later will probably be used in regular operation. Asked why the P. R. R. did not build its own electric locomotives he said that as the road was not regularly in the locomotive business it preferred to "go outside" although it always built its own sample locomotives.

Wood Preservers Meet at Houston

Consider ways to improve and extend use of treated timber—
Railways are well represented



Assembling the Preframed Timbers for a Bridge Deck at a Wood-Preserving Plant—A Refinement in Treating Practice That Is Rapidly Becoming Universal

THE refinement of standard practices for the treatment of timber to protect it against decay, the presentation and analysis of service records of timber that has been treated and the extension of treating processes to protect timber against other enemies, especially termites, occupied the attention of some 300 members and guests of the American Wood-Preservers' Association at the thirtieth annual meeting of this organization at Houston, Texas on January 23-25. Approximately 100 of these people traveled from St. Louis to the meeting on a special train provided by the Missouri Pacific, the Texas & Pacific and the Gulf, Colorado & Santa Fe, stopping enroute to visit timber-treating plants at Little Rock, Ark., Texarkana, Texas, and Somerville. While at Houston, the members also visited the three plants there. All sessions were presided over by R. S. Belcher, president of the association, and manager of treating plants, Atchison, Topeka & Santa Fe System.

In welcoming the convention to Houston, H. M. Lull, executive vice-president of the Southern Pacific Lines in Texas and Louisiana, referred to the anomaly presented by the attitude of our government with respect to agricultural production and to transportation. "Today," he said, "we see our government working on the one hand to curtail agricultural and manufacturing production, and on the other hand working at top speed to increase the already great surplus of transportation facilities by the construction with tax-payers' money of highways, airways and inland waterways. Cotton is being ploughed up, wheat and corn acreage is being reduced, live stock is being killed, the production of oil, lumber and other articles of commerce is being curtailed, yet the orgy of costly and useless expansion of transportation facilities goes merrily on. The cost of transportation and transportation facilities in this country today requires too great a percentage of our national income. There may be a difference of opinion about the government's policy of regulating and curtailing production, I do not criticize it, but it does not seem logical to proceed in the opposite direction in the case of transportation."

Mr. Lull concluded by pointing to the extensive use which the Southern Pacific has made of treated timber. A total of 213 miles of main track of this road is supported on timber trestles, he said. This railway has a number of ballast deck trestles of creosoted timber, con-

structed between 1889 and 1895, that are still in good condition with a majority of the original piling and stringers still in place.

Shortly after calling the convention to order, Mr. Belcher reviewed the progress of the organization and of the wood-preserving industry. As to the latter, he stated that while figures showing the volume of timber treated during 1933 are not yet available, the amount so protected in 1932 was but 45 per cent of that treated in the peak year of 1929. Referring to the economies made possible by wood preservation, Mr. Belcher stated that, "to the railroads, the pioneers in timber treatment in this country and still the largest users of treated wood, an enormous saving in maintenance of way expenditures has been made possible. Economies resulting from the extensive use of treated ties and timbers in years past, have proved a godsend to the railroads during the past few years of reduced earnings. Railways consume about 75 per cent of the output of the wood-preserving plants.

At the closing session of the convention, officers were elected for the ensuing year as follows: President, S. R. Church, consulting engineer, New York City; first vice-president, Frank D. Mattos, manager treating plants, Southern Pacific, Oakland Cal.; second vice-president, R. S. Manley, president, Orange Creosoting Co., Orange, Tex.; treasurer, H. L. Dawson, (re-selected); members executive committee, Ralph E. Meyers, International Creosoting and Construction Company, Galveston, Tex., and C. S. Burt, Illinois Central, Grenada, Miss. New York City was chosen as the place for the next convention.

Special Papers

The Users Day program on Wednesday morning, a regular feature of this association's conventions, was opened with an address by John Henry Kirby, president of the Kirby Lumber Co., Houston. Mr. Kirby paid tribute to the research work of the wood preserving industry and its value in developing and holding markets for lumber. But for this work, he said, lumber would today be facing a greatly lessened demand. Likewise, if it were not for this work, diminishing forests would constitute a national problem. As it is, remaining stands of timber are estimated variously to be sufficient to meet our present demands for 200 to 500 years.

R. J. Cummins, consulting engineer, Houston, traced

the increasing use of treated material for foundation work in recent years and cited a number of examples of satisfactory applications. He then referred at length to the failure during construction, of a large number of piling in a dock at Lake Charles, La., and to the lack of determination to date of the cause of this failure. He urged the association to undertake an investigation to ascertain what led to this failure and to develop measures to avoid a repetition of the trouble.

At a joint meeting with the Houston Engineers' Club on Wednesday evening, Dr. Hermann von Schrenk, consulting timber engineer, St. Louis, Mo., presented a paper on termites and methods of combating them. This paper will be abstracted in a later issue.

Other Papers and Reports

The experiences of the Santa Fe and other roads in seasoning timber in the East Texas area and the practices that have grown out of these experiences were set forth in an interesting paper presented by M. E. Jackson, superintendent, Santa Fe Tie and Lumber Preserving Company, Somerville, Texas. This paper will be abstracted in a later issue.

The Committee on the Treatment of Car Lumber, of which H. R. Duncan, superintendent timber preservation, C. B. & Q., was chairman, reported that it has approached the American Railway Association, Mechanical division, with the suggestion that the two organizations undertake a joint study of the extent to which it may be practical for the railways to treat the wood entering into the construction of cars.

Service Records

The Committee on Tie Service Records, of which W. R. Goodwin, engineer wood preservation, Soo Line, was chairman, extended for 1932 its compilation of the tie renewals per mile of line for 27 railways. These records now extend back to 1911 and show a decline in the five-year average of annual renewals for all these roads from 249 in 1911 to 142 in 1932. The committee also presented reports on records secured from test tracks on the Santa Fe, the Burlington, the Milwaukee, the North Western and the Cotton Belt railways.

The Committee on Bridge and Structural Timber, of which G. A. Haggander, bridge engineer, C. B. & Q., was chairman, presented a tabulation of the details of a number of bridges constructed of treated timber that are to form the basis for service record studies. As all of these structures except one, the Mobile & Ohio bridge over the Warrior river at Tuscaloosa, Ala., are but 2 to 5 years old, conclusive service data will not be available for a number of years. The M. & O. structure comprises 2989 ft. of creosoted pile trestle constructed in 1914 and 1915. According to an inspection made on April 1, 1933, its condition is good, while only 82 piles have been replaced because of decay and 67 caps have been removed because splitting had resulted in rot.

The report also embraced a statement of principles governing the preparation of plans for timber bridges to insure the most favorable service from treated wood. These provide, in the main, for a minimum of cutting of the wood in the field or for the maximum facility and simplicity in the preframing of timbers.

The Committee on Marine Piling Service Records, of which M. F. Jaeger, superintendent, Port Reading Creosoting Plant, Reading railway, was chairman, presented a report of an inspection of a dock in the St. Johns river at Jacksonville, Fla., built in 1909. In addition, it presented in tabular form, pertinent structural and treatment data and a brief inspection report concerning

16 other structures of various ages up to 45 years, all in San Francisco Bay. Dealing with the same subject was a short paper prepared by J. F. Coleman, consulting engineer, New Orleans, La., who reviewed the development in the use of creosoted piles in wharfs and docks along the Gulf coast and the progress that has been made in the formulation of specifications for creosote.

Among other features of the program was a report on Plant Operation, which will be abstracted in a later issue of the *Railway Age*. There was also a brief report on the diversified uses of treated wood, which was devoted largely to an account of applications to structures in military camps and reservations, air ports, oil fields and other structures outside the railway field. A paper by J. A. MacLean, senior engineer, United States Forest Products Laboratory, Madison, Wis., reporting studies of the temperatures of green southern pine timbers after various steaming periods, was also presented.

Painting Treated Wood

The Durability of Paint on Wood Treated with Zinc Chloride was the subject of a paper presented by F. L. Browne, senior chemist, United States Forest Products Laboratory, Madison, Wis. It is summarized briefly below:

The painting characteristics of wood treated with zinc chloride for preservation against decay were studied at the Forest Products Laboratory by observation of practical installations and by a carefully planned series of exposure tests in which matched specimens of wood were used with and without treatment. For interior surfaces the presence of as much as 1.5 lb. per cu. ft. of zinc chloride in boards 1 in. thick does not affect the behavior of interior flat or gloss paint significantly. For exterior surfaces it is entirely practicable to maintain zinc-treated wood with ordinary linseed oil paints, but the paints do not last so long on wood containing zinc chloride as they do on untreated wood. When wood treated with zinc chloride is primed with aluminum paint before applying ordinary white paint, the durability of the coating is greatly improved. Wood treated with a mixture of two parts of zinc chloride and one part of sodium dichromate by weight holds paint fully as well as similar but untreated wood. Since at least half of the zinc chloride in such a mixture must remain in the wood as such and whatever zinc dichromate is formed by the rest of the mixture is toxic in laboratory tests, the mixture offers promise as a wood preservative, although service tests to determine that point are lacking. The mixture of zinc chloride and sodium dichromate may be given serious consideration for uses in which preservation is necessary and maximum economy in paint maintenance is desired and where service records proving satisfactory effectiveness as a preservative are not considered essential.

Treating Green Beech, Birch and Maple Ties

To determine whether satisfactory penetration of the preservative could be secured in the green timber by the boiling-under-vacuum process or by a preliminary oil bath and also to determine the relative degree of checking after treatment, a series of experiments were conducted with green beech, hard maple and yellow birch ties at the Canadian Forest Products Laboratory. The ties were treated with a 70-30 creosote-coal tar mixture and the results were set forth in a paper by J. F. Harkom, chief of the division of wood preservation of the laboratory, the conclusions of which were as follows:

Penetration, equivalent to, or better than, that obtained in air-seasoned ties, can be secured.

Beech ties check severely after treatment in the green condition and should be air-seasoned before treatment.

It is doubtful if the treatment of green maple ties can be considered, owing to the fairly large percentage that check severely after treatment.

Indications are more favorable with respect to the treatment of yellow birch ties in the green condition, but comparison with air-seasoned ties in track is necessary before a definite statement can be made.

Wood Preservation in England

A feature of the program was the presentation of a review of the development and present status of timber

preservation in England, prepared by Sir Ralph G. Pearson, former director of the Forest Products Research Laboratory of England. In general the development of the science of timber treatment there has approximated that in America. There are now in operation in England a total of 204 treating plants, including 109 pressure plants, 14 of which are railway owned. The total volume of wood treated annually in England approximates 50,000,000 cu. ft., including some 4,000,000 railway ties. Railway engineers claim a life of 20 to 25 years for a tie in main line, after which it is often used in a branch line or yard track. The London & North Eastern built a line in 1903 with creosoted redwood ties, 75 per cent of which were found to be sound when the line was relaid in 1933. These ties were probably treated by the full cell process with 12 to 15 lb. of creosote per cubic foot of timber.

The Report on Preservatives

The report of the Committee on Preservatives, of which R. E. Waterman, chemist, Bell Telephone Laboratories, was chairman, was concerned in part with measures undertaken jointly with the Committee on Wood Preservation of the American Railway Engineering Association, to reconcile minor differences between the standard specifications of the two associations for creosote and creosote-coal-tar solution. To this end the report recommended the withdrawal of specifications for creosote oil, grades 2 and 3, since there are now practically no creosotes of these two grades available except by special manufacture. The committee also recommended the withdrawal of Footnote No. 1 to the Standard Specifications for Creosote-Coal-Tar Solution which places certain limitations on the use of this preservative, since this solution is now used so widely that the implication of the footnote no longer applies. Both of these recommendations were approved by the association.

The use and requirements of creosote and petroleum for use in mixture treatments was reported in a paper by J. S. Giddings, chemist, Atchison, Topeka & Santa Fe, which is abstracted in brief below:

The Santa Fe test track at Cleveland, Tex., includes 815 hewn ties of several kinds of wood and treated with various mixtures, the proportions of which varied from one part creosote and two parts petroleum to one part creosote and four parts petroleum. These ties were treated in the experimental cylinder of the Somerville, Tex., plant of the Santa Fe in 1909 and 1910. All of these ties were inserted in the test track from 2 to 2½ years after they were treated.

The annual rainfall in the Cleveland section is more than 50 in., with high humidity and temperature practically throughout the year. The track is laid with 90-lb. rail, dirt ballast, 7½-in. by 9-in. tie plates, and cut spikes. While the figures on the average annual tonnage since the insertion of these ties are not available at this time, the 1929 gross tonnage was 4,187,684.

The records show that 302 ties, or 37.06 per cent, of the original 815 ties had been removed up to December 31, 1932. Thus, a total of 513 ties remain in the track after a service of from 19 to 20 years under the conditions noted. The computed average life in track of the entire group up to December 31, 1932, is 17.87 years.

Attention is called, also, to a record of sawn western yellow pine ties inserted in track between Texico, Tex., and Lubbock in 1913. Out of a total of 8,259 ties inserted, only 239 ties have been removed after 19 years in track. These ties were treated with a 50/50 creosote-petroleum mixture, to 7 lb. per cu. ft. The average

annual rainfall in this section is believed to be between 15 and 20 in.

Reports on Poles

The report of the Committee on the Pressure Treatment of Poles, of which R. H. Colley, Bell Telephone Laboratories, was chairman, was divided into three parts, namely, new specifications for pressure-treated creosoted pine poles, a report on bleeding and a report on conditioning. The report on bleeding is abstracted below:

BLEEDING

There are several factors that affect bleeding, which are subject to control, the most important being the treatment process, the retention of creosote, the type of creosote, the viscosity and the resultant color of the pole. Bleeding may not be totally eliminated through the control of these factors, as variations in the structural characteristics and the moisture content of the various poles in the charge may bring about a lack of uniformity in treatment which means differences in retention and as a consequence, differences in bleeding.

Examination of matched test posts confirms practical experience to the effect that poles treated by a 12-lb. full-cell process bleed more than poles treated by an 8-lb. empty-cell process. After 1½ to 6 years' exposure 75 per cent of the empty-cell posts of a group treated in 1926 were listed as "clean," whereas only 12.2 per cent of the full-cell posts were so listed. After the same exposure none of the empty-cell posts was listed "severe asphaltic," whereas 17 per cent of the full-cell posts were so listed. With respect to the retention of preservative it was reported that 61.1 per cent of some posts treated up to 10 lb. were listed as "dry" or "damp" while only 27.7 per cent of the posts treated to 10.1 lb. or more were so listed. Of the posts treated up to 10 lb., 16.7 per cent were "wet" while 54.6 per cent of the posts treated with 10.1 lb. or more were so listed.

The residue above 355 deg., C., of the creosote used in the treatment of test specimens has been found to be an important factor in the bleeding of pine poles. Moreover, observations of poles in actual service confirm the results obtained on the test posts,—the greater the amount of residue above 355 deg., C., the greater is the tendency to bleed.

The two characteristics of creosotes that seem to be functions of the residue and most likely to affect bleeding are viscosity and color. While the work of the subcommittee has not been carried far enough to explain the exact mechanism of bleeding, there appears to be a definite correlation between viscosity, residue and bleeding.

It has been noted that during periods of intense solar radiation black poles are warmer to the touch than brown poles and that the surfaces exposed to the sun are warmer than the shaded portions. In a series of tests, higher temperatures were recorded on the black posts than on the brown-black and brown posts and that the black posts bled more than the brown posts. In general, the use of light colored creosote, usually low residue oil, results in brown poles.

CONDITIONING

The report on conditioning was summarized as follows:

1. Under certain climatic conditions and proper control, poles can be conditioned satisfactorily for treatment by air seasoning.
2. Poles can be conditioned for treatment by steaming and vacuum, but the removal of moisture is not as great as when the poles are air seasoned.
3. Poles that have been air seasoned for 30 to 60 days and then

steam-and-vacuum conditioned are apparently in excellent condition for creosote impregnation.

4. When steam-and-vacuum conditioning is employed, the poles should be steamed in accordance with their size, the larger the pole the longer the steaming time required to obtain a given result.
5. There appears to be no advantage in using steam temperatures above 259 deg., F.
6. If steam temperatures below 259 deg., F. are used, a correspondingly longer steaming period is required to remove equivalent amounts of moisture.

The committee's recommendations on this subject were as follows:

1. Whenever possible, poles should be stacked on the yard and allowed to dry to a moisture content somewhere between 30 and 45 per cent of their oven dry weight.
2. Poles should be steamed in accordance with their size. [The committee submitted a table of suggested periods of steaming at different pressures.]
3. The vacuum following the steaming period should be drawn as quickly and to as high a degree as plant facilities will permit.

The committee also presented revised specifications for the treatment of Southern pine poles, which were approved in large part as to technical standards, after extended discussion, with the understanding that the phraseology will be revised to bring these specifications into conformity with other specifications of the association before submission to letter ballot.

Other Papers and Reports on Poles

The Committee on Non-Pressure Treatment of Poles outlined a contemplated investigation of the development and effect of checks in poles on decay. J. A. Vaughan, research engineer, Southern Wood Preserving Company, described experiments which he has made with the addition of 0.5 to 2 per cent of vegetable phosphatides (lecithins) to creosote to reduce the bleeding of poles. When poles are treated with this mixture, according to Mr. Vaughan, the distribution of the preservative in the sap wood is more uniform than in an ordinary empty cell treatment, the usual heavy concentration of the oil in the outer annual rings is reduced and the tendency of the poles to bleed is eliminated.

The Committee on Pole Service Records, of which H. A. Haenseler, engineering department, Western Union Telegraph Company, was chairman, submitted reports on 11 pole-line installations that had not heretofore been reported on and provided additional information regarding 6 installations reported on previously.

The Essentials of Pole Service

By R. E. Meyers*

In the past, wood was said to be "air-dried" in preparation for its treatment. Now we "condition" wood in preparation for its treatment; by air-seasoning, or steam-seasoning, or by a combination of the two; and each under proper control has given good results. One authority states that the best treatment is usually obtained in wood that is air-seasoned. In a report presented at this convention, the statement is made that, "A greater amount of oil can be injected into air-seasoned timber for a given net retention than in steam and vacuum-conditioned green poles. This results in better and more uniform penetration."

But time is not always available for air-seasoning. It requires a system of quick dispatch from the woods to the seasoning yard. Some concerns date-mark every pole when it is cut, and again when it reaches the treat-

ing plant. This requires well built yards and a trained personnel. The user more often than not wants poles quickly, and leaves no time for an air-seasoning operation. To meet this situation, steam-seasoning or a combination of air-seasoning and steaming is common.

Another development in conditioning is the growing practice of injecting four pounds of creosote into the wood to make safe storage possible over a greatly extended time. When shipping orders come, the poles are framed as required, and treated with an additional four pounds of creosote *after framing*. The creosote goes into perfectly conditioned poles whose checks, having already formed, act as distribution centers for the creosote during the treating operation.

In the treating itself, eight pounds of creosote per cubic foot final retention is used almost everywhere. It gives a much deeper penetration than did the 12-lb. full-cell treatment of a decade ago. Fortunately, there is now better recognition of the value of penetration, improved methods of obtaining it, and more exact means of measuring it. Lack of uniformity in penetration is evidence of improper conditioning; and is avoidable. Proper conditioning not only gives uniform penetration, but gives a cleaner and less bleeding pole in the line. It can be taken as an axiom in pole preservation that the deeper the penetration the better. True, the white untreated heartwood in the center of a pole has natural decay resistance, but it is not as durable as creosoted sapwood.

A few years ago the user of pine poles placed his order, and expected delivery some three months later—providing all went well. Now he wires the order in, requests and gets 24-hr. shipment. He finds that the treating industry provides him with a pole having a high degree of cleanliness and non-bleeding.

Studies by the Ohio Brass Company have brought new recognition to the insulating value of wood and now the economy of the wood pole transmission structure extends to 110-kv. and 132-kv. lines. Long ago we noticed also that creosoted pine placed in a breaking machine in strength tests, had great flexibility, poles 40 ft. long deflecting 10 to 15 ft. before they could be broken. Engineers are beginning to recognize the usefulness of this characteristic when a pole line is under storm stress.

We are told that the fires that rage across the dry cane fields of Cuba crack insulators, burn untreated wood to ashes and even melt steel; and that the greatest degree of fire resistance has been secured with creosoted pine poles. Undoubtedly this is the same action that occurs in smaller degree on the railroad right-of-way where creosoted poles are damaged less than adjacent untreated fence posts.

As to life, a survey of lines in the vicinity of Houston covering about 4,000 poles, all more than 16 years in service and one line more than 24 years in service, indicates the remarkably low total of 100 replacements from decay—less than 0.3 per cent replacements. The Humble Oil and Pipe Line Company, within the past two years, has built within 135 miles of Houston 3 lines with creosoted pine poles from dismantled lines whose poles had been 100 per cent salvaged.

To users, I urge that you encourage quality in your creosoted pine poles. It is obtainable at so small a premium, that the increased cost is but a small fraction of the value of the installed pole. The wisdom of having a reserve of strength in pole lines has been particularly apparent during the present depression, when lines have had to carry on despite deferred maintenance. Where security of lines in storms is at stake, the extra cost to obtain quality is an investment in efficiency.

* International Creosoting and Construction Company, Galveston, Texas.

Eastman's Regional Staff Studies Operating Economies

WASHINGTON, D. C.

AN account of the studies being conducted by the regional staff of the federal co-ordinator of transportation of the possibilities for effecting economies in operation through unification or co-ordination of terminal operations, joint use of shops, stations and other facilities, the pooling of traffic or service, the elimination of wasteful routes, etc., is included in the report of the activities of the Co-ordinator's organization from June 16 to December 31, 1933, which was transmitted to the President and Congress on January 20. The report points out that more difficulty has been encountered in the work of the regional staff than in any other branch of the Co-ordinator's work, because of the labor restrictions in the act. This was the field of economy through co-ordination which the carriers had particularly in mind when the emergency act was under consideration by Congress, the report says, and they were preparing to proceed vigorously and expeditiously with it. The following text of the report outlines some of the difficulties experienced and the progress now being made:

These economies, however, are very largely labor-saving in character, and the restrictions of Section 7 (b) on reduction in labor employment, as they were interpreted and applied by the Co-ordinator, put a stop to immediate accomplishments in this direction.

In order to expedite the work at important points where inter-carrier complications were particularly acute, the carriers have agreed to an arrangement under which the studies of terminal co-ordination at Chicago, St. Louis, Kansas City, Omaha and the Twin Cities have been placed in charge of his western regional director, and those at New Orleans, Birmingham, Atlanta, and Memphis have been placed in charge of his southern regional director.

What has happened in the western region will serve as an illustration of the difficulties which have been encountered generally. The report of the Co-ordinator's western regional director presents the situation very well, and the description of what has been done in that region, which follows, is largely in his language.

Western Region

The personnel of the staff in this region is as follows: V. V. Boatner, regional director; C. E. Hochstedler, regional traffic assistant; J. E. Hutchison, assistant regional director (San Francisco); J. P. Cowley, assistant regional director (Dallas); W. L. Bean, mechanical assistant.

Terminal Studies

In making a personal survey of the larger terminals, the director early reached the conclusion that to obtain the maximum possibilities it would be necessary to establish a completely unified terminal organization, separately operated.

To make a study of practical value for terminal operation in a city the size of Chicago, it was found necessary to circumscribe the area within certain limits, and then for a stated period to follow the traffic, both carload and less-than-carload, also empty cars, in and out and through all of their diverse channels. This was also necessary to ascertain present methods of handling and the cost thereof, and thus get a true picture of all of the duplications in movement, service and facilities. This is being done. The primary work is largely accomplished. The facts are then to be assembled, and a potential operation (based on practical methods determined by the men now carrying on the work) will be projected by the regional director and traffic assistant. Previous terminal studies have been made at Chicago, but the basis upon which they were conducted has made them of little value in the present study. The same is true at St. Louis.

A report has been completed for Omaha and one is approaching completion at Kansas City. A report has been rejected and is being reworked on an entirely different basis at Twin Cities. The work is well along at Chicago. In other parts of the Western Region it was found necessary to have the studies at practically all of the moderate-sized terminals reworked upon a basis different from that undertaken by the various committees, in

order to obtain a proper reflection of the actual possibilities. This was true at Denver, Dallas, Houston, Fort Worth, St. Joseph, Oklahoma City and other points, on account of the meager, and apparently cursory, surveys made, and which were induced by the method of approach and general desire to protect competitive and strategical positions, as well as property rights, thus preventing a thorough exploration of the possibilities.

Categorically, the major projects undertaken are:

First. The survey at Chicago, St. Louis, Kansas City, Omaha, Twin Cities and Twin Ports. Also surveys at active smaller terminals involving two or more lines, where the possibilities are not so large.

Second. Consideration of the pooling of passenger service between Chicago, St. Louis, Kansas City, Omaha and the Twin Cities. Report is expected on this item at an early date. It is intended to project the study into the Southwest from Kansas City, Omaha and Denver and from the Twin Cities to the Pacific Coast.

Third. Pooling of freight service. This was suggested to the coordinating committee, but they deemed expedient to defer definite study along these lines until the director should be in a position to give the committee information concerning merchandise traffic out of Chicago and St. Louis, and livestock and packing-house-products from primary markets to Chicago. This can be done very soon. It will be withheld, however, until after the traffic assistant completes a conference with the director of transportation service in Washington and ascertains what is proposed in regard to the handling of merchandise, based on his national survey.

Fourth. A study is being made of pairing or joint use of branch lines with a view to overcoming taxes and maintenance of one line and possible reduction of operating expenses.

Fifth. A committee of traffic vice-presidents of both eastern and western lines is conducting a study and will file a report and recommendations concerning a proposed movement of cargo or trainload lots at reduced through rates from originating areas to primary markets, together with a system of rates therefor which will not greatly disturb the present rate parities. The idea is to enable the carriers to compete more effectively with water transportation.

Sixth. Upon completion of the terminal study and submission of report covering Omaha and Council Bluffs, it is thought that it may be possible to effectuate a practical demonstration of what can be done, by putting the suggested arrangement into effect. This will involve displacement of 364 employees, who under the act will have to be compensated upon the basis of May, 1933. Since various carrier interests involved desire to protect, even temporarily, traffic and strategic relations and advantages now existing, it will take some time to work out details of a plan of procedure.

Seventh. A study has been projected on the Chicago & North Western Railway and Chicago, Milwaukee, St. Paul & Pacific Railway for co-ordinating facilities and operations at all common points, pooling service and traffic between such points. These lines lend themselves to considerable economies under such an arrangement. Abandonment or unification of lines has not been suggested to the co-ordinating committee except in a general way, leaving the railroads free to handle those matters through federal and local commissions.

Eighth. Elimination of competitive city ticket offices, and possible substitution thereof of central offices, with branch offices in connection with the Western Union Telegraph Company or the Bell Telephone Company, effecting economies and widely increasing sales possibilities.

The announcement of the Co-ordinator's organization stated that there would be associated with each regional director a man experienced in traffic problems of shippers, who would supply this point of view to the organization and provide a point of contact for shippers.

Following his appointment, the Western Traffic Assistant addressed the representatives of the principal commercial and trade associations of the western region, apprising them of the duties imposed upon him, and soliciting their aid and co-operation in attaining the ends sought by the emergency act. The response was uniformly favorable and was followed by many personal contacts, all of which indicated an attitude on the part of the public to co-operate wholeheartedly in any improvement contemplated.

Inasmuch as the traffic assistants were appointed members of the advisory committee to assist the director of transportation service, a great deal of time has been devoted to a study of the handling of merchandise traffic, particularly in the Chicago district and at St. Louis, which is mentioned elsewhere in this report.

Eastern Region

The personnel of the staff in this region is as follows: H. J. German, regional director; W. H. Chandler, regional traffic as-

sistant; H. H. Temple, assistant to director; E. J. Bauer, assistant to director.

The carriers in the eastern region have a rather elaborate organization of committees to inquire into opportunities for coordination and economy, and a very large number of projects are docketed for consideration. To date, however, there have been comparatively few final reports on these projects.

Prior to the passage of the act the carriers had devoted much attention to terminal operations in the New York district, with especial reference to unification of the marine facilities for freight handling in the harbor. A common utilization of facilities has already been partly effected, and plans have been developed under which all that are owned by the railroads will be pooled and operated under one management in behalf of all carriers. This would permit substantial economies in operating and maintenance expense, and also important reductions in capital investment accounts. The Co-ordinator's staff has gone thoroughly into this New York situation, and has collaborated in its study, not only with the carrier committees, but also with the Port of New York Authority. The study has included possible better utilization of the union inland freight station which the Port Authority has constructed on lower Manhattan, and consolidation of freight piers looking toward the gradual elimination of various pier leases. One such pier was given up by the Erie, when the lease expired on November 1. The study which has been made indicates possible future economies in terminal operations amounting to several million dollars. Definite arrangements have been made for the consolidation of railroad facilities at Wallabout Basin, Brooklyn.

A number of large and comprehensive projects involving heavy capital expenditures in the construction of new tunnels or bridges at New York or in the rearrangement or abandonment of existing terminal facilities and the construction of others have been pressed on the attention of the Co-ordinator's staff. It has been felt that the Co-ordinator's staff should concentrate on what can be done with existing facilities rather than to attempt to deal inadequately with proposals for large capital expenditures.

Similar studies are being made at other ports. Certain practices of the carriers at all the ports in assuming expense in the transfer of carload freight to and from ships have been considered, and a plan is well under way for the discontinuance of these practices, where they are not justified, and for the establishment of uniform and equitable rules and regulations. Similar consideration is being given to the present free use of railroad piers by ships at the North Atlantic ports, with a view to assessing a charge against the ships which will in part compensate the railroads for the use of terminal facilities furnished by them to steamship companies. Elimination of the cost now borne by the railroads in loading or unloading intercoastal or coastwise freight is also being considered; likewise the cost of loading and unloading package freight, other than that which is delivered at piers by car floats; payments for top wharfage on freight delivered locally from railroad-owned piers; contract arrangements with outside concerns for the lighterage of lumber, grain, sugar, flour, wood pulp, corn products, logs, hides, vegetable oils, etc.; and contract arrangements for stevedoring with individuals or companies interested in the movement of commodities after final railroad delivery, including leases of property to stevedores and truckmen. A further matter receiving consideration is the discontinuance by railroads of costs incurred in loading or unloading cars and lighters moving export and import freight, and also domestic freight in certain situations, and the establishment of a uniform practice in this respect at all Atlantic, Gulf and Pacific ports. Included in this subject is the payment of dockage charges assessed by steamship lines and private terminals on railroad lighters and cargoes.

It is recognized that in many of these matters plans which are formulated must be equitable to all ports, without disturbance of port relationships.

Particular matters in New York harbor which are being studied are loading practices at the piers, involving the continuance or discontinuance of the use of public loaders; contract arrangements for heavy lift operations, looking to a uniform arrangement by all New York lines for the purpose of insuring one basis of rates and common practices; rearrangement of contracts, whereby a single trucking company would be used by each railroad for trucking in lieu of lighterage; uniform and reduced towing charges on Newton Creek and Harlem River; and reduced and more uniform charges by the New York Dock Company and Bush Terminal in handling freight ex-warehouses and ex-piers.

Extensive investigation is being made of opportunities for consolidating produce terminals at New York, Philadelphia, Baltimore, Detroit, Cleveland, and Buffalo, the purpose being to provide one common market to the produce trade at each of these large cities and to secure to the carriers operating economies which will result if service is provided to such a union market instead of to two or more separate markets. Study is also being

given to methods and practices at produce terminals generally, looking to the elimination of waste and also improvement in the service rendered to receivers of perishable freight.

Definite recommendations have been formulated and referred to the carrier committees looking to improvement in standard packages for the handling of fruits and vegetables. It appears possible that two to four million dollars per year might be saved in loss and damage claims in this way, but it is realized that full opportunity to be heard must be afforded to shippers before such a plan is made effective. Study is also being given to the establishment of a joint bureau representing all the eastern carriers for the examination of loss and damage claims on perishable freight, the object being to provide uniform consideration of all such claims and thus avoid discrimination and payments which cannot be justified. An arrangement for the joint inspection of fresh fruits and vegetables on arrival has already been installed at 31 of the larger communities in the Eastern region. The purpose is to bring about uniformity in inspection practices and to reduce freight-claim expense.

The practices and charges of the carriers in the New York district with respect to the warehousing and storage of property have been the subject of a recent report by the commission. This matter will be followed up by the Co-ordinator's staff both there and at other North Atlantic ports. The consolidation of grain elevator service at such ports, particularly Baltimore, is being considered.

Various individual projects with respect to the unification of terminal operations at various points have been referred to the carriers for study.

Recently, at the recommendation of the Co-ordinator's staff, steps have been taken by the carriers to make a complete survey of terminal unification possibilities at typical larger cities in the eastern region. Because of the individual projects already under consideration at Detroit, and the opportunities which it is believed to present, such a study has been begun at that point. A similar study has been instituted at Buffalo, and one or more other centers may be selected for this purpose.

Certain projects involving joint use of railroad lines are also under consideration.

Carrier committees have also been organized to study possibilities of pooling of competitive passenger, and also freight, service in certain situations. A considerable number of projects of this character have been docketed for consideration. A committee is also working on the elimination of unduly circuitous routes, and considerable has been done in this direction.

Other matters which are under consideration, either at the instance of the Co-ordinator's staff or otherwise, are the use of joint car inspectors at all car interchange points; interchange of surplus materials between the different railroads; movement of empty equipment for return haul of company material; undue advertising by means of outdoor signs; equipping automobile cars with blocking and decking devices; holding of unconsigned coal free of demurrage for mines; demurrage on tidewater and Lake coal; joint credit arrangements at common points; consolidated agencies for the collection of freight bills; off-line agencies for solicitation of passenger and freight business; unnecessary maintenance of city ticket offices; commissions for soliciting freight and passenger traffic; icing arrangements for refrigerator cars; and expense items due to memberships in local chambers of commerce and similar organizations.

The regional traffic assistant has also given much thought to the study of railroad tariff simplification, including the consolidation of terminal tariffs at North Atlantic ports, and has made recommendations to the Co-ordinator in regard to these matters which are receiving consideration in connection with other suggestions of a similar nature.

Southern Region

The personnel of the staff in this region is as follows: C. E. Weaver, regional director; M. M. Caskie, regional traffic assistant; W. C. Kirby, assistant.

The principal objective has been the economies possible through unification or joint use of facilities at common points, of which there are some 580 in the South. Reports covering 163 of these points have been received and studied by the Co-ordinator's staff, but many of them have been unsatisfactory and have been returned for further information.

In order that the possibilities of terminal unification at some of the larger centers may be thoroughly investigated, without embarrassment from carrier rivalries, the carriers' Regional Coordinating Committee has agreed that the regional director shall take charge of the studies at Atlanta, Birmingham, and New Orleans, and perhaps at Memphis also.

Carrier committees are also considering the possible pooling of traffic and of freight and passenger train service, but there seems to be little prospect that they will have much to suggest along these lines. In the circumstances, the Co-ordinator's staff

has undertaken a study of the routing restrictions which it appears practicable to apply in connection with established rates in lieu of the wide-open routing which now exists and which produces waste in car-mileage. Typical routing charts used by the Railroad Administration in the South during the federal control period are being studied in this connection. In due course it is hoped that the Co-ordinator's staff will be able to offer concrete recommendations which will accomplish much the same result as the pooling of traffic or train service.

The staff has made a personal survey of all of the port facilities and terminals at Hampton Roads, New Orleans, Mobile, Jacksonville, and Savannah, meeting not only with the carriers' representatives, but also with representatives of the publicly-owned terminals or facilities at those ports. As a result, a memorandum was furnished to the Co-ordinator of what appeared desirable in the way of reasonable dockage charges and how the various terminal charges could be stabilized and placed on a remunerative basis. This information will be considered by the Co-ordinator in connection with the port-charge situation generally on the Atlantic and Gulf coasts, for it is clear that no group of ports can be considered without consideration at the same time of all competing ports.

Early in its work, the staff undertook a study of drayage absorptions and allowance at the port of New Orleans on certain carload freight moving in volume, a practice which existed nowhere else in the Southern region, and which was depleting carrier revenues, including those of the Public Belt Railroad, which held itself open to perform switching service from industries and the public docks at charges substantially less than the drayage allowances made by the line-haul carriers. This work is nearing a successful conclusion, all east and west side carriers, except one, having agreed to withdraw these allowances on commodities other than coffee. In the case of the latter, the conditions seem to make it necessary to continue the allowances, but this situation is being further investigated.

The staff has secured from the commission's Section of Tariffs an interpretation of the commission's order of October 12, 1915, with respect to the posting of tariffs, which will enable the carriers in the future to maintain in each state at the points designated in the order, one complete file of all the freight tariff publications to which each carrier is a party, making it unnecessary to maintain separate offices or files. Joint agency tariffs, which now generally prevail, instead of the individual line tariffs which predominated in 1915, can all be put in one room or building, the files co-ordinated, and a large saving effected.

Annual Report of Bureau of Safety

THE Interstate Commerce Commission has issued its usual pamphlet, 24 pages, in the nature of a supplement to its annual report, containing the report of the director of the Bureau of Safety. It is dated December 1, and is for the fiscal year ending June 30 last. The special work done during the year includes progress on tests of new types of air-brake equipment for freight cars, and tests of automatic train pipe connectors; also safety appliances for new types of cars, including rail-motor cars and stream-lined, light-weight, articulated trains. An extensive investigation has been made into irregularities in the operation of automatic train control and cab-signal devices, and the conclusions of the Commission concerning residual magnetism and the danger of false clear operation are given in detail.

The number of train accidents investigated during the year was 59; collisions, 28, and derailments, 31. The principal causes of these 59 accidents are recounted at considerable length. Broken arch-bars have been the cause of five accidents, and, says the report, cars with arch-bar trucks (no longer approved by the A. R. A. for new cars) should be the subject of special caution. The report again suggests the necessity of legislation for more thorough safeguards in the transportation of explosives and inflammables on the highways.

The routine work of the Commission has been carried

on as usual. The number of freight cars inspected, 1,262,962, is slightly less than in the preceding year, and the percentage found defective was 2.10, as compared with 1.85 in the preceding year; passenger cars inspected, 24,167; percentage defective, 1.13; locomotives inspected, 18,207, percentage defective, 1.19.

The usual air-brake tests were made, both of trains as made up and trains as arriving. It was found necessary on an average to set out one car with inoperative brake equipment for every four trains tested.

Permission to put experimental running boards on freight cars is extended until further orders.

Instances of over-time work by train men and telegraphers were fewer than in the preceding year, and of 905 roads, 713 reported no excess service. The reasons why trainmen worked over 16 consecutive hours are given in a table summarizing the records for five years. For 1933, the principal reasons were: Derailments, 328; landslides, high water or fire, 136; adverse weather conditions, 207; wrecking and relief service, 587; total of all causes, 1,519.

Block-signal Statistics—Totals for January 1, 1933, are briefly stated (these statistics, not published in a bulletin, as in former years, were given in abstract in *Railway Signaling*, for August, 1933, page 223). The total mileage of road block signaled, 113,581, is 2,743 miles less than the year before. Statistics of automatic train control and automatic cab signals are brought down to July 1, 1933. The roads on which automatic train control and cab signals are in operation are as below, and the total mileage of road thus operated is 2,400:

Atchison, Topeka & Santa Fe	Illinois Central
Boston & Maine	Long Island
Central of New Jersey	Louisville & Nashville
Chicago & North Western	New York, New Haven & Hartford
Chicago, Milwaukee, St. Paul & Pacific	Oregon-Washington
Delaware, Lackawanna & Western	Reading System
	Richmond, Fredericksburg & Potomac

The roads using cab signals without wayside signals are: The Santa Fe, C. & N. W. and Illinois Central.

The roads using automatic cab signals without brake setting apparatus are as follows and the total mileage of road is 1,460: Hudson & Manhattan; Lehigh Valley; Norfolk & Western; Pennsylvania; Union Pacific.

Twenty-five gauntlets and 285 railroad grade crossings are equipped with automatic signals without interlocking machines, a decrease of eight grade crossings and one gauntlet, as compared with one year previous.

Centralized traffic control was in operation on January 1, 1933, on 987 miles of road, including 169 passing tracks, with 800 switches controlled.

A few extracts from the annual report of the Commission are appended to the report. Suits in court for violations of safety-appliance laws were begun during the year, to the number of 103, and 97 cases were pending at the end of the fiscal year. Nine railroads have been authorized to discontinue maintenance and operation of automatic train control, as follows: Chicago, Burlington & Quincy; Chicago, Indianapolis & Louisville; Chicago, Rock Island & Pacific (Iowa Division only); Delaware & Hudson; Great Northern; Missouri Pacific; Northern Pacific; St. Louis-San Francisco, and Texas & New Orleans; total mileage of road, 1,469; total number of locomotives, 715.

The following roads have been authorized to substitute cab signals for automatic train control: Central of New Jersey; Delaware, Lackawanna & Western; Long Island; Norfolk & Western; Pennsylvania; Reading; Union Pacific; total mileage, 1,988; total locomotives, 3,255. The petitions for this change presented by the Baltimore & Ohio, the Boston & Maine and the Chicago, Milwaukee, St. Paul & Pacific were denied. Other petitions were pending at the end of the year.

NEWS

Railroad Labor to Press Its Legislative Program

Committee appointed to remain in Washington and conduct an intensive campaign

The Railway Labor Executives' Association has appointed a legislative committee of five members to remain in Washington and devote their time to the conduct of an intensive campaign for the enactment of the program of railroad labor legislation recently adopted by the association, including revision of the railway labor act, a six-hour day bill, a train limit bill, a full-crew bill, amendment of the hours of service law, and amendment of the employers' liability. The committee consists of B. M. Jewell, president of the Railway Employees' Department, American Federation of Labor; T. C. Cashen, president of the Switchmen's Union; George M. Harrison, president of the Brotherhood of Railway Clerks; Charles M. Sheplar, president of the National Marine Engineers' Beneficial Association; and A. F. Whitney, president of the Brotherhood of Railroad Trainmen and chairman of the association. The committee has held conferences on the program with President Roosevelt and with Co-ordinator Eastman, whose Labor Relations Section is making a detailed investigation of various proposals included in the program.

Bills to limit the car length of trains have been introduced in the House by Representatives Griswold and Withrow, H.R. 7399 and H.R. 7401, and on January 27 Senator Black of Alabama introduced a six-hour day bill, S. 2519, and an hours of service bill, S. 2518.

Representative Crosser has also introduced a similar six-hour day bill, H.R. 7430 and Representative Griswold has introduced a full-crew bill, H.R. 7489.

The six-hour day bill would amend the Adamson eight-hour day law to provide that after July 1 six hours (except where a lesser number of hours constitute a day under existing agreements) shall be deemed a day's work and the measure or standard of a day's work for the purpose of reckoning the compensation of railroad, express, sleeping-car and freight forwarding companies. It proposes the appointment of a commission of three to observe the operation and effect and the facts and conditions affecting the relations between carriers and employees for a period of nine to twelve months and report its findings to the President and Congress and would provide that meantime the compensation of employees for a standard six-hour workday shall

not be reduced below the present standard day's wage.

The train limit bills would make it unlawful for a railroad to operate passenger trains of more than 14 cars or freight trains more than half a mile in length or of more than 70 cars.

The hours of service bill would require that all employees should have at least twelve consecutive hours off duty in each 24-hour period and would limit the hours of telegraph and telephone operators to nine, and those of train dispatchers to six, a day.

Splawn Appointment to I. C. C. Confirmed

The President's appointment of Dr. W. M. W. Splawn as a member of the Interstate Commerce Commission, succeeding Ezra Brainerd, Jr., was confirmed by the Senate on January 27, following a favorable report by the committee on interstate commerce on January 16.

Belt Line Case Under Advisement

The petition filed by the government, in which it seeks to force the United States Steel Corporation either to sell the Elgin, Joliet & Eastern or to discontinue having its products carried on the road, was taken under advisement by Federal Judge Charles E. Woodward at Chicago on January 25 at the close of a 10-day hearing.

Pullman S. O. S. Sales Doubled Since Rate Cut

Reduced railroad fares and elimination of the Pullman surcharge in December doubled the sales of single-occupancy sections in Pullman sleeping cars, according to a survey of the Pullman Company in 34 districts in the West and Southwest. In those territories, sales totaled 20,089 sections in December, 1933, as compared with 10,883 in November, before the rates were cut, and 12,917 in December, 1932.

Ten-Year R. F. C. Loans to Railroads Proposed

For the purpose of increasing the ability of the Reconstruction Finance Corporation, Chairman Jones has proposed to the Senate committee on banking and currency an amendment of the R. F. C. act authorizing an extension of the maturity of its railroad loans, now limited to three years, to ten years. Mr. Jones suggested to the committee a plan by which the corporation might aid in the financing of railroad maturities by underwriting refunding bond issues in some cases, agreeing to take such portions of an issue as could not be sold through the usual banking channels.

New Fast Service into New England from Middle West

Pennsylvania, in conjunction with New Haven and B. & M., expedites freight deliveries

The Pennsylvania, in conjunction with the New York, New Haven & Hartford and the Boston & Maine, has inaugurated a new fast freight service which provides third-morning delivery of shipments from the Middle West to New England points and first-morning delivery at these latter points from Potomac Yard (Washington, D. C.), on the South. The set-up for the expedited service involves the daily operation into New York of three high speed freight trains—one from Chicago, another from St. Louis, Mo., and the third from the South, via Potomac Yard. These three trains are scheduled to arrive in New York each evening in time to connect with a New Haven train which in turn connects at Cedar Hill (Conn.) Yard with the New Haven's "Maine Bullet."

The trains from the West and South also have connections through the Wilkes-Barre, Pa., gateway and the Delaware & Hudson, which latter carries their cars to Mechanicsville, N. Y., where a Boston & Maine connection provides the expedited service to Boston, Mass.

The cars routed via New York make their "Maine Bullet" connection at Cedar Hill at 9:00 p. m. of the second day following their departure from Western points and the same day of their departure from Potomac Yard. The "Maine Bullet" is scheduled to arrive at Worcester, Mass., at 12:40 a. m., Lowell, 4:30 a. m., Lawrence, 5:30 a. m., and Portland, Me., 9:00 a. m., thus providing at these points the third morning delivery from Chicago and St. Louis and the first morning delivery from Potomac Yard. Also the "Maine Bullet" connects at Worcester, Mass., with a B. & M. train for Boston giving the latter city the same service.

The new service is available to all classes of carload traffic, including perishables, packing house products and non-perishable freight. "The schedules," the announcement states, "are as rigid in their requirements as those of passenger trains in providing the quickest possible freight service into the New England territory."

American Transit Association

The fifty-third annual convention of the American Transit Association will be held in the new exhibition hall of the Cleveland Public Auditorium, Cleveland, Ohio, September 24 to 28, inclusive.

Railroad Taxes in 1932 Were 38 Per Cent of Net

Bureau of Railway Economics study shows this ratio to be the highest since 1920

Class I railroads of the United States in 1932 paid in taxes to the various federal, state and local governments 38.04 cents out of each dollar of net earnings, the highest ratio for any year since 1920, according to a study of railway taxation just completed by the Bureau of Railway Economics. In 1931, they paid 31.46 cents per dollar, and in 1930, 25.81 cents.

Railway taxes in 1932, according to a bulletin based on the study, totaled \$275,135,399. While this was a reduction of \$28,392,700 compared with the amount paid in 1931, the reduction resulted only from further shrinkage in rail earnings and not because of any appreciable lessening of tax rates on tangible or intangible property.

On the basis of total operating revenues, the railroads in 1932 paid in taxes 8.8 cents out of each dollar of such revenues received, the highest ratio for any year. In 1931, 7 1/4 cents was paid in taxes out of each dollar of operating revenues.

"Total taxes," according to the study, "paid by railways of Class I in 1932 amounted to \$275,135,399. State and local governments received \$262,705,576 of the total, or 95.5 per cent, while the federal government received \$11,928,446 or 4.3 per cent; the remaining \$504,377 or 0.2 per cent was credited to the accounts of countries across our national boundary lines. Taxes paid by the railroads to the federal government are practically all in the form of the corporation income tax, less than two per cent in 1932 consisting of other than income taxes, such as the tax on telegrams, documentary taxes, and the like. For this reason, federal taxes have shown a considerable decline since 1929, in sympathy with the decline in net income of the carriers. Taxes paid by the railroads in the several states and local jurisdictions showed a consistent increase for many years to 1930, while the years 1931 and 1932 showed some recessions."

The bulletin pointed out that on the basis of statistics published by seven State Public Service Commissions for the year 1931 the weighted average ratio of taxes to total operating revenues for bus and truck operations in those states was 5.9 cents per dollar of operating revenues. These ratios, it was pointed out, cover all taxes and fees, including gasoline taxes, revenue and income taxes, and the like.

"Total operating revenues of Class I railroads in the United States," the bulletin continued, "amounted to \$4,188,343,000 in 1931. Out of every dollar of this revenue, 7.25 cents went directly for taxes. But this percentage cannot properly be compared with the ratio of taxes for motor carriers, because motor taxes are in part a contribution toward the cost of their roadways, whereas the railways maintain their own roadways and pay taxes besides. In addition to their direct taxes, 7.25 cents per dollar of gross earnings in 1931, the railways were chargeable in that year for

ten cents per dollar of revenue for maintenance of roadway, 12.2 cents for annual carrying charges on roadway, and four-tenths of one cent for the cost of crossing protection. The total railway ratio, including roadway costs and taxes, was 29.8 cents per dollar in 1931.

"In other words, the total tax payments of the steam railways in 1931, plus an allowance for the expense of owning, maintaining and protecting their roadway was three-tenths (29.8 per cent) as great an amount as their total operating revenues. Commercial motor vehicles in 1931, so far as statistics are available, contributed less than one-sixteenth (5.9 per cent) of their operating revenues for the same group of costs."

Commissioner Porter on I. C. C. Finance Division

Commissioner Claude R. Porter has been appointed a member of the Interstate Commerce Commission's Division 4, which handles proceedings on the commission's finance docket. He succeeds Ezra Brainerd, Jr., whose term as a commissioner expired on December 31. Commissioners Meyer, Mahaffie and Eastman are the other regular members of the division but other members are occasionally assigned to it to take the place of Mr. Eastman since he assumed his duties as co-ordinator.

Ten Days Allowed for Grain Rate Arguments

Time allotments amounting to over 10 1/2 days have been tentatively made by the Interstate Commerce Commission for the oral arguments in the western grain rate case, Part VII of the Hoch-Smith investigation, which are to begin on February 7. The commission ordinarily sits for 4 1/2 hours a day when hearing arguments. The tentative allotments include 900 minutes for the railroads, 120 for the lower Missouri river markets, and amounts ranging from 15 to 60 minutes for various representatives of the shippers and state commissioners. The investigation has been in progress since 1927. The present argument follows a rehearing required by the decision of the Supreme Court which set aside the former order.

Reading and Pennsylvania Co-ordinate Bus Service

The Reading Transportation Company and the Pennsylvania Greyhound Lines have co-ordinated their bus operations between New York and Philadelphia, Pa., and between New York, Allentown, Pa., Reading and Harrisburg. Each company will operate its own vehicles but there will be no competitive schedules as heretofore and terminals will be used jointly. On the basis of the division of schedules agreed upon, the Greyhound company will predominate in New York-Philadelphia traffic and the Reading in the New York-Allentown-Reading-Harrisburg runs. There will be 29 daily round-trips between New York and Philadelphia, 14 to Allentown, 9 to Harrisburg and 8 to Reading. The Reading buses are operated, in part, in behalf of the Jersey Central Transportation Company.

C. P. R. Loan Guarantee Attacked in Parliament

Opposition objects to backing \$60,000,000 advance without Parliamentary debate

The inevitable attack of the Liberal opposition in the House of Commons at Ottawa upon the action of the Bennett Ministry in making a \$60,000,000 guarantee to the Canadian banks of their loan for that amount to the Canadian Pacific last year came early this week when the Liberal leader, Rt. Hon. W. L. Mackenzie King, in the debate on the speech from the Throne in which the policies of the Government are outlined, scored the Government for giving aid to a private corporation under the Unemployment Relief Act. Mr. King said in part: "I have in my hand a copy of an order in council giving a guarantee to the banks of their loan of \$60,000,000 to the Canadian Pacific Railway Company. The loan was made by the banks I believe in midsummer, or an undertaking was given I understand at that time that the loan would be made. On November 29 the government formally by order in council guaranteed the banks to the extent of \$60,000,000 in this matter, and this was done under the Unemployment Relief Act. This is the kind of thing that I have been taking exception to all afternoon, the guaranteeing and expending of public moneys for the purpose of assisting corporations, and then allowing it to be understood by the public that these millions upon millions are being spent in order to help unemployed workers in different parts of the country."

"I should like to know why the Prime Minister kept this order secret for so long a time."

Mr. Bennett (the Prime Minister): "He did not. It was issued on November 29 when it was passed, and a copy of it was sent to the right hon. gentleman by myself."

Mr. Mackenzie King: "In the early part of the summer word was current all over the country that the government was going to support the banks in their loan to the Canadian Pacific Railway Company."

Mr. Bennett: "The order in council itself sets out the reasons for it."

Mr. Mackenzie King: "The order in council was passed on November 29, and a copy of it was sent to me a few days afterwards, probably because my hon. friend had seen that a month or so before, when it was current rumour that the order had been passed, I had stated that I did not know whether the order in council had been passed or not, but that if it had been passed I thought parliament at least should have been consulted before any guarantee of such an amount should be given to any corporation. What I take exception to is that, in these matters which involve an increase in what the Prime Minister has described as a colossal public debt already arising from the railways, we in this House of Commons should be made responsible for another guarantee of \$60,000,000 to a railway, and not have an opportunity of even having our voices heard."

Davis Discusses Safety With D. L. & W. Employees

Highway safety also a matter of concern—Unequitable competition cited

Calling upon employees at a safety meeting at Scranton, Pa., on January 26 not to relax their vigilance in the promotion of safety on the railroad, J. M. Davis, president of the Delaware, Lackawanna & Western, also urged them to foster safety on the highways. Quoting from a report of the National Safety Council summarizing highway fatalities, he favored strict enforcement of safety regulations and wide-spread publicity as means of improving conditions.

"In 1933," he said, "thirty-six Lackawanna trains were struck by motor vehicles and fifty-five automobiles were driven through our crossing gates in utter disregard of every thought of personal safety and without heeding red crossing lights, ringing bells and other warnings. Some time ago I looked into the causes of highway accidents at railroad crossings. We had a record made of the actions of drivers of motor vehicles when crossing railroad tracks. The large majority of the drivers crossed the tracks without so much as reducing speed. The records were used by automobile clubs and others to promote safety and to prove contributory negligence.

"The Lackawanna has spent since 1910 nearly thirty millions of dollars upon improvements solely for the elimination of grade crossing of its tracks. That amount of money, invested chiefly in the interest of humanity, represents about 20 per cent of the Lackawanna's present guaranteed obligations.

"In some communities, many parents have lost control of their children at least to the extent that the children trespass upon railroad property. They climb the fences to play around the cars, on the tracks and in the yards. Many children are maimed for life by the railroads when they should not have been on the railroad property. Committees of mothers and committees of women's organizations in each borough should devote their thought to this serious problem."

Mr. Davis reviewed the company's pension policies, told of the efforts of the D. L. & W. management to keep as many of its employees as possible on the payroll during the depression and mentioned some features of the competitive situation in transportation which are detrimental to the railways and their employees.

"Taxpayers of the state of New York," he said, "pay about \$10,000,000 annually towards the operation of the state's canal system. The last authentic figures we have show that last year about three million tons of freight were handled upon New York's canals, the cost per ton to taxpayers being about \$3.33. The railroads between Buffalo and New York would have been very glad indeed to handle those three million tons for considerably less than the amount paid by the

taxpayers, much of it by the railroads, for the upkeep of the canal.

"Oswego, N. Y., one of the ports on Lake Ontario, is served by three railroads including the Lackawanna. The state operates at this port an elevator for the storage of grain. The storage rate to the shippers on this grain is higher when it is shipped out by railroad from Oswego than when it is shipped by the state owned canal. It seems to me that is very unfair and that it is a discrimination on the part of the state against the railroads and some of its best taxpayers.

"The Transportation Act of 1920, the existing law, is generally recognized by shippers and railroads as being inadequate. It is hoped that a new law better adapted to the nation's transportation requirements will be enacted. This is the work upon which the Transportation Conference and other groups are centering their attention with the hope that the new Transportation Act, if and when enacted, may adjust the unfair situation in which we find our country under which one system of transportation is regulated strictly while other competitive agencies are allowed to operate virtually free of regulation.

"The American people, so far as I know, are strongly opposed to the government engaging in business. I cannot conceive that they will resort to permanent government ownership or bureaucratic overlordship of the transportation agencies, communication lines, banking and industry generally."

Comprehensive Transportation Legislation May Be Delayed

President Roosevelt is still hopeful that a plan can be developed for co-ordinating the regulation of all forms of transportation, including waterway and highway transportation, under the direction of a single governmental body, probably the Interstate Commerce Commission with increased jurisdiction, but it is understood that he is not certain whether such legislation will be ready for consideration at this session of Congress. He has withheld any comment on Co-ordinator Eastman's first report, which was transmitted to him on January 20, pending receipt of Mr. Eastman's later reports. In the first report Mr. Eastman said it would be followed by others dealing with the questions as to the need for federal legislation to regulate other transportation agencies and to co-ordinate all means of transport, amendments to improve details of the present system of regulating the railroads, and legislation to improve railroad labor conditions and relations. While not certain as to how soon the second report will be ready Mr. Eastman is now planning to combine in it the consideration of regulation of other transportation and improving railroad regulation, reserving for a later report the consideration of subsidies to other transportation agencies. This will, under the law, first be submitted to the Interstate Commerce Commission for its comments and it is expected that the commission will require some time to formulate its expressions on the subject. It made no comments on the first report because it did not include specific recommendations for legislation.

Railroads Support Motor Carrier Regulation Bill

A. R. E. general counsel appears before House committee considering Rayburn proposal

A statement in support of the Rayburn bill to provide for the regulation of bus and truck transportation by the Interstate Commerce Commission was begun on January 31 by R. V. Fletcher, general counsel of the Association of Railway Executives, at the hearing before the House committee on interstate and foreign commerce which has been in progress since January 17. He said the bill is not the railroads' bill but that they support it, taking the position that if the government is going to regulate the railroads it should also regulate their competitors but that if it is not to regulate their competitors there should be some relaxation of railroad regulation.

Judge Fletcher submitted for the record a number of statements reflecting views as to the regulation of highway transportation which he said show that there is a demand for it from the shipping public and from within the industry itself. Referring to the estimates made a few years back in the Interstate Commerce Commission's report that the trucks were handling 6 per cent of the freight traffic handled by the railroads he said there are indications that the percentage would be considerably higher now. He made the point that it would be impossible to effect a co-ordination of the different forms of transportation under N. R. A. codes and said that a central regulatory authority could bring order out of the chaos which truck operators had complained of as being due to reductions made by railroads.

W. L. White, president of the American Short Line Railroad Association, also testified in support of the bill, saying that the short lines have suffered proportionately more from unregulated motor vehicle transportation than have the trunk lines, by reason of the fact that the short lines are not able to recoup their losses on long-haul traffic and the short-haul traffic is more susceptible to truck competition than the long-haul traffic. C. A. Miller, general counsel of the association, endorsed the bill but suggested certain amendments.

Opposition to the bill was voiced before the committee on January 18, by Judson C. Welliver and Harold L. Schertz on behalf of the American Trucking Associations, Inc. Mr. Welliver made an attack on the railroads, declaring that government regulation of them began as an effort to get relief from monopoly and characterizing the Rayburn bill as evidence of the efforts of the railroads to put truck transportation out of business. Chairman Rayburn interrupted to say that there was no intention to enact legislation to put competing agencies of transportation out of business but that "there is going to be some kind of government regulation and it does not give the committee much information to say that this is a railroad bill." He pointed out that all the state commissions were for the bill and said he did not think that all

of them were under the control of the railroads. What he desired of the witnesses, he said, was not an attack on the railroads but suggestions as to what ought to go into the bill.

Mr. Schertz said the association is not in opposition to regulation in principle nor to regulation of trucks operated for hire but that it believes that self-regulation under the proposed N. R. A. trucking code offers an excellent opportunity to make real headway with the many complex problems whereas the reverse would be true if the industry was placed under the Interstate Commerce Commission. He made the point that regulation by code authority would make a start toward obtaining the essential facts about the industry and comparative costs, saying that the problem is very different from that of regulating a few hundred railroads because there are at least 90,000 truck operators that would have to be apprehended and policed. He said that state regulation had provided a laboratory test and had proved ineffective and that the plan proposed by the bill was cumbersome and could not be enforced, whereas the state and local subdivisions of the code authority would afford more effective machinery. The truck situation, he said, is not one that requires the fixing of maximum rates but minimum rates and the code authority would be able to develop a proper method of ascertaining costs.

On January 19, A. M. Hill, president of the National Association of Motor Bus Operators, pointed out that the association has advocated regulation of interstate bus operations since 1925, and that it had collaborated in the preparation of the bill now before the committee but was not in sympathy with legislation that would include both busses and trucks in one bill Congress having failed to enact bus regulation, the industry is now operating satisfactorily under its N. R. A. code. "We do not appear before this committee to question its right to regulate the motor bus industry," he said, "nor do we advocate self-regulation by the industry rather than regulation by a specific law enacted by Congress. Our efforts to comply with law enacted by Congress last summer were in every way sincere and the industry has given complete co-operation to make such regulation a success. Now, if in its wisdom Congress decides that certain industries shall be lifted out of the national industrial recovery act and regulated under separate laws, we are not here to protest that exercise of judgment. However, we cannot help wonder what the effect of regulation of the motor bus industry by the Interstate Commerce Commission will be in view of the demonstration we have had in the past few months of the leniency of the commission in regulating rail passenger carriers."

Eric A. Johnston, of Spokane, Wash., a member of the special committee of the Chamber of Commerce of the United States which made a report on the subject, voiced approval of the main features of the Rayburn bill but urged clarification of certain provisions to avoid possible interpretation as requiring that motor contract carrier rates, otherwise fair and adequately compensatory, should be raised to the level of the rates of common carriers. There are other detailed provisions of the bill,

he said, on which the chamber has not specifically voted but this in no way minimizes the strong support of the organization for the principles of the bill.

Frank H. Rawlings, of Fort Worth, Tex., on behalf of the common carrier truck operators of Texas, supported the principle of federal regulation of truck operations to avoid the complications resulting from diverse regulation by various states.

To Consider Readjusting C. N. R. Capitalization

The tangled question of a reconstruction of the financial set-up of the Canadian National will be before Parliament at Ottawa again this session, since a British Columbia Liberal member, Albert E. Munn, has a resolution on the order paper of the House calling for a writing down of the capitalization. During the regime of the late Sir Henry Thornton and when Hon. Charles Dunning was Minister of Railways, George Gaston, a financial expert of New York, was engaged in making a study and report on this subject, but the then Government decided the time was not opportune for attempting a writing down. The present administration has also been opposed to it.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 2205, 150 Broadway, New York, N. Y.

ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Ave., Chicago, Ill. To meet with Air Brake Association, Car Department Officers' Association, International Railroad Master Blacksmiths' Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers' Association and the Traveling Engineers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago, Ill.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Union Station, St. Louis, Mo. Annual meeting, June 19-21, 1934, Hotel Sherman, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 Federal St., Chicago, Ill.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—(See American Transit Association.)

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York, N. Y. Annual meeting, June 12-14, 1934, Hotel Stevens, Chicago, Ill.

Division II.—Transportation.—G. W. Covert, 59 E. Van Buren St., Chicago, Ill.

Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York, N. Y.

Division IV.—Engineering.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 13-14, 1934, Palmer House, Chicago, Ill.

Construction and Maintenance Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 13-14, 1934, Palmer House, Chicago, Ill.

Electrical Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York, N. Y. Annual meeting, March 12-13, 1934, Hotel Stevens, Chicago, Ill.

Division V.—Mechanical.—V. R. Hawthorne, 59 E. Van Buren St., Chicago, Ill.

Equipment Painting Section.—V. R. Hawthorne, 59 E. Van Buren St., Chicago, Ill.

Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII.—Freight Claims.—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, May 22-24, 1934, Hotel Commodore, New York, N. Y.

Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York, N. Y.

Car Service Division.—C. A. Buch, 17th and H Sts., N. W., Washington, D. C.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago, Ill.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—J. A. Senter, Ind. Agt., N. C. & St. L. Ry., Nashville, Tenn. Annual meeting, 1934, Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 13-14, 1934, Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—J. L. James, L. & N. Employees' Magazine, Louisville, Ky.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M., St. P. & P. R. R., 11402 Calumet Ave., Chicago, Ill. Exhibit by Tool Foremen Suppliers' Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York, N. Y. Railroad Division.—Marion B. Richardson, Ahrens & Richardson, 30 Church St., New York, N. Y.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York, N. Y.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St., N. W., Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual meeting, May 16-18, 1934, Hotel Cleveland, Cleveland, Ohio.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., 1519 Daily News Building, 400 W. Madison St., Chicago, Ill. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—J. W. Shoop, The Lehon Company, Oakley Ave., 44th and 45th Sts., Chicago, Ill. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 S. Morgan St., Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 S. Main St., Los Angeles, Cal. Club not active at present time.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—J. F. Brady, Main and Barton Sts., St. Louis, Mo. Operation suspended indefinitely.

CENTRAL RAILWAY CLUB OF BUFFALO.—M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 2920 Utopia Place, Hyde Park, Cincinnati, Ohio. Operation suspended indefinitely.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Regular meetings, second Monday of each month, except June, July and August, Hotel Cleveland, Cleveland, Ohio.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—

T. D. Smith, 1660 Old Colony Building, Chicago, Ill.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York, N. Y. Annual Meeting, November 12-15, 1934, Washington, D. C.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, Suite 322, 910 S. Michigan Ave., Chicago, Ill.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section (See Safety Section, American Railway Association).

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Friday of each month, except June, July and August, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings, second Thursday of each month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, Transportation Building, Washington, D. C. Annual meeting, 1934, White Sulphur Springs, Va.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton (Treas. and Asst. Sec.), First National Bank Building, Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago, Ill. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. R. A. Division I.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 1252 Syndicate Trust Building, St. Louis, Mo.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1428 Broad Street Station Building, Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual meeting, September 18-20, 1934, Hotel Stevens, Chicago, Ill.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Meetings temporarily suspended.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. R. A. Signal Section.

SOCIETY OF OFFICERS, EASTERN ASSOCIATIONS OF RAILROAD VETERANS.—M. W. Jones, Baltimore & Ohio, Mt. Royal Station, Baltimore, Md. Annual meeting, October 6-7, 1934, Buffalo, N. Y.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. R. R., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Division V, Equipment Painting Section.

TOOL FOREMEN SUPPLIERS' ASSOCIATION.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago, Ill. Meets with American Railway Tool Foremen's Association.

TORONTO RAILWAY CLUB.—N. A. Walford, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, first Friday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago, Ill. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 E. 98th St., Cleveland, Ohio.

WESTERN RAILWAY CLUB.—C. L. Emerson, C., M., St. P. & P., Chicago, Ill. Regular meetings, third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago, Ill.

Equipment and Supplies

First Money Advanced on P. W. A. Loans to Railroads

After months of negotiations the government's plan for making loans to railroads for maintenance and equipment to create employment and business took on a tangible aspect on January 25 when it was announced that the first check had been mailed out by the Public Works Administration to the Pennsylvania for \$6,990,000 as the first installment on the loan of \$77,000,000 for electrification work and the acquisition of 7,000 freight cars and 101 electric locomotives. The money will be expended in the next 60 days.

The contract for the P. W. A.'s \$12,000,000 loan to the Southern Pacific was signed this week.

The Chesapeake & Ohio has applied to the Interstate Commerce Commission for authority for the expenditure of \$18,290,000 for new equipment, which had been allotted to it by the P. W. A., and also for authority for the issuance of the equipment trust certificates, making some change in the original plan as to the number of cars. It is now proposed to acquire 800 steel box cars of 50 tons capacity, 6,000 steel hopper cars of 50 tons capacity, 1,000 steel gondola cars of 50 tons capacity, 15 steel passenger coaches, and 11 steel mail and express cars.

The Boston & Maine has applied to the Interstate Commerce Commission for authority to issue notes or other evidences of indebtedness for \$3,330,000 to the P. W. A., stating that it is believed the latter will accept its ten-year 4 per cent notes provided reasonable collateral can be given. Of this \$1,100,000 is for repairs and improvements to cars and locomotives and \$2,230,000 for the purchase of 30,000 tons of 131-pound and 112-pound rail and fastenings.

The commission has approved the proposed expenditure by the Midland Continental of \$40,000, the proceeds of a loan from the P. W. A., toward the purchase of an oil-electric locomotive to cost approximately \$52,000. The report states that the company operated such a locomotive experimentally for four months in 1932 and showed a saving of 0.66030552 mill a gross ton-mile as compared with the cost of operating a steam locomotive.

The commission has authorized the Lehigh Valley to issue \$2,000,000 of notes to be delivered to the P. W. A. in connection with a loan for repairs and improvements to equipment and also to assume obligation and liability in respect of \$3,410,000 of various first-mortgage bonds to be pledged as collateral for the notes. It has also modified a previous order to permit the pledge of the company's equity in \$2,600,000 of Consolidated Real Estate Company bonds, now pledged with the Railroad Credit Corporation.

The New York, Chicago & St. Louis has applied to the commission for authority for the expenditure of \$5,062,000 for new equipment, for which a loan has been al-

lotted by the P. W. A., and for the issuance of equipment trust certificates in connection with the loan. The application includes a revised list of the equipment to be acquired, including 675 55-ton gondolas instead of 500 gondolas and 175 stock cars as originally proposed.

The Lehigh & New England has applied to the commission for authority for the expenditure for 250 steel box cars, 150 all-steel hopper cars, and 100 composite flat gondola cars, for which an allotment of \$1,500,000 has been made by the P. W. A.

LOCOMOTIVES

THE NEW YORK, CHICAGO & ST. LOUIS has ordered from the Lima Locomotive Works five switching locomotives of the 0-8-0 type and 20 tenders of 19,000 gal. capacity. Inquiry for this equipment was reported in the *Railway Age* of December 23, 1933.

FREIGHT CARS

THE DOW CHEMICAL COMPANY has ordered two aluminum tank cars of 8,000 gal. capacity from the General American Transportation Corporation.

Pennsylvania Building 7,000 Freight Cars

The Pennsylvania will begin work within a few days on the 7,000 freight cars which it plans to build in its own shops, with part of the proceeds from the \$77,000,000 loan which it recently received from the Public Works Administration. The 7,000 cars will consist of 500 steel box cars 40 ft. 6 in. long, 10 ft. high and 9 ft. 2 in. wide, designed for carrying automobiles and equipped with mechanical loading devices enabling each car to haul four automobiles instead of two or three; 3,000 of this type of car without the automobile loader; 2,000 standard steel box cars and 1,500 flat cars 50 ft. long of 70 tons capacity.

Of the 7,000 cars, 166 box cars with loaders, 1,000 box cars without loaders, 668 standard steel box cars and 500 flat cars, a total of 2,334, will be built at the P. R. R. Altoona (Pa.), shops; 167 steel box cars with loaders, 1,000 box cars without loaders, 666 standard box cars and 500 flat cars, a total of 2,333 cars, will be built at its Enola shops, and the same number and types of cars will be built at its Pitcairn shops. This will provide a year's employment at Altoona for about 400 men, who will be required for work on the fabrication of material for all the cars and about 300 men who will be engaged in construction work. In addition 300 men employed on construction work will be given a year's employment at each of the other two shops.

Later in the year 101 electric locomotives will be acquired by the railroad, resulting in the employment of hundreds of additional men in the railroad shops and in the electrical and other industries throughout the country.

PASSENGER CARS

THE NORFOLK & WESTERN, reported in the *Railway Age* of December 30, as in-

Why Any 10-Year Old Locomotive Is INADEQUATE

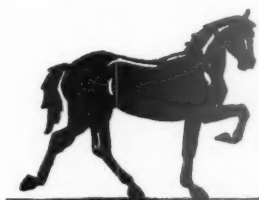
What Has Happened To HORSEPOWER!



1912
475 H. P.
per driving axle

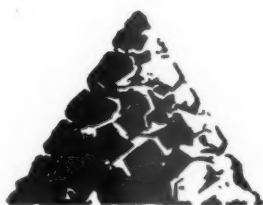


1922
575 H. P.
per driving axle

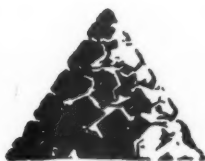


1932
OVER 1,000 H. P.
per driving axle

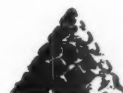
What Has Happened To FUEL CONSUMPTION!



1912
6½ LBS. COAL
per drawbar
horsepower



1922
5 LBS. COAL
per drawbar
horsepower



1932
3 LBS. OR LESS
per drawbar
horsepower

SO rapid has been the advance of locomotive design that not a single locomotive in this country over ten years old can begin to hold its own with the really up-to-date power plant on wheels known as the Super-Power locomotive.

LIMA LOCOMOTIVE WORKS
INCORPORATED

LIMA



OHIO

quiring for 10 coaches and 8 combination passenger and baggage cars, has ordered this equipment from the Bethlehem Steel Company.

Western Roads to Air-Condition 300 Cars

The western railroads have decided to air-condition the club, dining, lounge and observation cars in all of the principal through passenger trains operated in western territory prior to late spring, according to an announcement made by H. G. Taylor, chairman of the Western Association of Railway Executives. Final details of the plan have not yet been completed but it is estimated that it will include the installation of air-conditioning equipment in at least 300 cars additional to cars now so equipped.

Construction

Start Work Bonnet Carre Spillway Structures

Orders have been placed for the piling and timbers, and bids have been received for the grading required for the bridges that are to be built by the Illinois Central and the Yazoo & Mississippi Valley across the Bonnet Carre spillway in Louisiana.

The Yazoo & Mississippi Valley structure, which will be required to cross a waterway opening 9,000 ft. wide between flanking levees, will consist of 8,000 ft. of single-track, creosoted, ballasted deck trestle, flanked on each end by 500 ft. of embankment. The continuity of the timber structure will be interrupted at intervals of 1,000 ft. by a steel deck girder span, with a concrete slab floor on concrete piers, and concrete fire walls will be provided half-way between the girder spans for the purpose of separating the trestle into units 500 ft. long. The track will be raised 14 ft. above the level of the existing track for the purpose of providing a headroom 3 ft. above the calculated maximum flood level in the spillway. The bridge will be located parallel with, and 60 ft. west of the center line of the existing track.

The Illinois Central bridge will be a double-track structure, crossing a waterway opening of 12,000 ft. between flanking levees, and will be similar in construction to the Y. & M. V. bridge except that there will be no approach embankments inside the levees. The track will be raised 12½ ft. above the present elevation of tracks, and the bridge will be located 73 ft. west of the center line of the existing tracks.

The construction of the two bridges will require 1,110,000 lin. ft. of creosoted piling, from 70 ft. to 90 ft. long, 5,840,000 ft. b. m. of creosoted timber, 8,400 cu. yd. of concrete, 12,000 lin. ft. of untreated foundation piles and 1,000 tons of structural steel. The construction of the run-offs required by reason of the raises in grade will entail the placing of 260,000 cu. yd. of embankment. The grading and

the concrete work for the piers and fire walls will be done under contract, but the pile trestle construction and the erection of the girder spans will be handled by company forces.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—A contract has been awarded to the Thorgersen & Ericksen Company, Chicago, for the construction of a blacksmith shop at Milwaukee, Wis., a portion of which was destroyed by fire on January 8. This is a one-story structure, 80 ft. by 416 ft., and is of concrete and steel construction. The reconstruction work will involve an expenditure of \$46,000.

DENVER & RIO GRANDE WESTERN.—Jesse H. Jones, chairman of the Reconstruction Finance Corporation, has announced that the request of Representatives Lewis and Taylor of Colorado, an examiner of the Railroad Division of the Reconstruction Finance Corporation, accompanied by two members of the staff of the Interstate Commerce Commission, made an inspection of the Dotsero cut-off on December 19 and 20. At a conference with J. S. Pyeatt, president of the Denver & Rio Grande Western, held in Washington on January 20, Mr. Pyeatt reassured the Reconstruction Finance Corporation that track laying would probably be completed and connection with the Denver & Salt Lake at Orestod will be made about March 15. While the track work can progress at the rate of four thousand feet per day, the work is subject to interruptions at several points pending completion of one tunnel, two bridges and several short trestles. Erection of the engine terminal facilities at Orestod will be undertaken as soon as the track is pushed forward to that point and material can be brought in over the Denver & Rio Grande Western's own line. While it is expected that engine terminals at Orestod will probably be completed by June 1, any delay will not prevent the opening of the line beyond the latter date, which was set by Mr. Pyeatt, subject to unexpected contingencies of the weather and construction.

MAYO & COOK'S HAMMOCK.—The Interstate Commerce Commission has denied the application of this company for authority to construct a 13-mile line from a connection with the Live Oak, Perry & Gulf at Mayo, Fla., southwesterly to Cook's Hammock.

NEW YORK CENTRAL.—A petition of this road for a rehearing on the order directing the elimination of the Belle Isle crossing in the town of Camillus, Onondaga county, N. Y., has been denied by the New York Public Service Commission. The crossing is located on the main line and West Shore divisions about a quarter mile west of Belle Isle station. The order directed the elimination of the crossing by carrying the county highway over both the main line and West Shore tracks west of the Belle Isle railroad yards near Syracuse. Onondaga county assumed the entire cost of a bridge on the south approach and the southerly approach of the project as far north as the creek bridge. (See *Railway Age*, December 9, page 830.)

Supply Trade

The Scullin Steel Company, St. Louis, Mo., will resume operations in its plant on February 8 with a force of 400 men. The plant was shut down on November 15.

W. B. Joyce, Beverly, Mass., has been appointed sole New England representative for the Ruby Railway Equipment Company, Philadelphia, Pa. A. W. Boorom, New York, who formerly covered this territory, will continue to represent the company in the New York area.

Arthur H. Young has been appointed vice-president in charge of industrial relations of the United States Steel Corporation, with headquarters at New York. From 1899 to 1917 he held various positions at the plants and in the operating departments of the Illinois Steel Company and the Colorado Fuel & Iron Company. During 1917 and 1918 he served as director of the American Museum of Safety in New York, and later for six years was manager of industrial relations of the International Harvester Company. Since 1924, Mr. Young has been director of Industrial Relations Counselors, Inc., New York.

Journal Bearings and Castings Code Approved

Administrator Hugh S. Johnson on January 29 approved the code of fair competition for the railway brass car and locomotive bearings and castings manufacturing industry. The code provides for a normal work-day of eight hours for all employees, with no employee permitted to work in excess of 40 hours per week, except that during peak production periods the work-week may not exceed 48 hours for not more than four weeks in any six-months' period. Time and one-half is to be paid for work in excess of eight hours per day or 40 per week. No employee under the code may be paid less than at the rate of 40 cents per hour in the North, and 32 cents per hour in the South. It is estimated that operations under the code will effect an increase over the figures for 1932 of approximately 23 per cent in the number of employees and of 18 per cent in the total payrolls. Approval of the code is subject to a directed revision, within 30 days, in the by-laws of the Association of Manufacturers of Railway Brass Car and Locomotive Journal Bearings and Castings, the proponents.

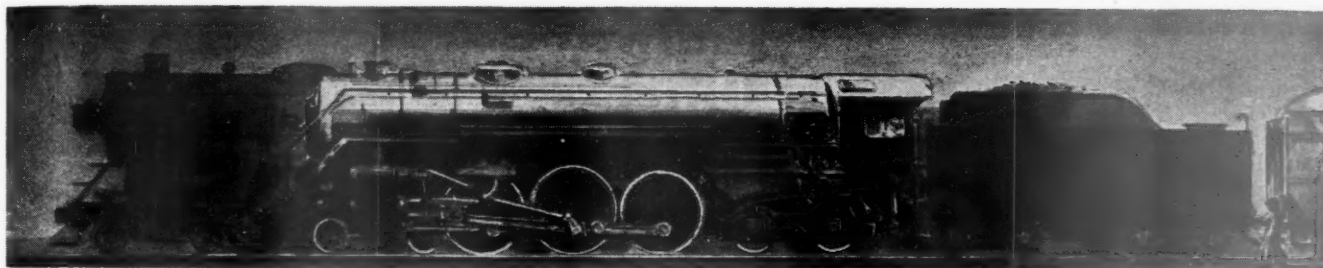
OBITUARY

Henry G. Elfborg, president and treasurer of the H. Channon Company, Chicago, and at one time chief engineer of the Ajax Forge Company, died in Chicago on January 30.

Harry G. Chapman, vice-president and general manager of the Cyclone Fence Company, a subsidiary of the United States Steel Corporation, with headquarters at Waukegan, Ill., died in Pittsburgh, Pa., on January 30, following a heart attack.

HOW

The Locomotive BOOSTER LOWERS MAINTENANCE

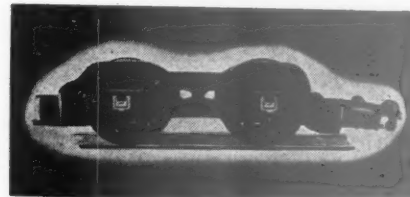


*Excess capacity is uneconomical,
just as excess tonnage is expensive.*

In starting, you need the maximum draw-bar pull. To get this by merely building the whole locomotive larger with bigger cylinders and more drivers is uneconomical when a smaller locomotive incorporating The Locomotive Booster can start an equal load.

Only in starting is The Locomotive Booster in use. After that, the smaller locomotive does the work, resulting in a lower cost for maintenance.

For economical operation, year in and year out, employ The Locomotive Booster as an integral part of your new power. It is equally important for existing power and is just as easily applied.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

Financial

BALTIMORE & OHIO.—Final Valuation.—The Interstate Commerce Commission has issued its final valuation report as of 1918 finding the final value for rate-making purposes of the property used by the Baltimore & Ohio system as of that date to be \$655,138,100, including \$22,144,545 for working capital. The outstanding capitalization as of that date was \$648,897,698.

BANGOR & AROOSTOOK.—Increases Dividend.—The directors of this company have declared a quarterly dividend of 63 cents on its common stock (par \$50), thus raising it from a \$2 annual rate to \$2.50, or 5 per cent.

CHICAGO, BURLINGTON & QUINCY.—Bonds.—The Interstate Commerce Commission has authorized this company to issue \$2,000,000 of general mortgage 4 per cent bonds, all or part of which may be used as collateral security for short term notes.

CHICAGO, ROCK ISLAND & PACIFIC.—Abandonment of Trackage Rights.—The Interstate Commerce Commission has authorized this company and its trustees to abandon operation over the Wabash near DeBaliviere avenue, St. Louis, Mo., and a connection with the Terminal R. R. Assn. of St. Louis, near Grand avenue, 3.1 miles.

PENNSYLVANIA.—Securities.—The Interstate Commerce Commission has authorized this company to issue not exceeding \$45,000,000 of 30-year secured 4 per cent serial bonds and to assume liability as guarantor in respect of \$17,000,000 of series E, and \$15,000,000 of series F equipment trust certificates dated January 15, 1934. One-twenty-seventh of the principal of the series E certificates will be due on each January 15 and July 15 until fully repaid and one-thirty-seventh of the series F on these same dates, maturities not to start, however, until 1936. The certificates bear interest at 4 per cent and are to be sold at par to the United States government. The bonds likewise are to be sold to the government and are to be secured by the pledge of \$6,503,000 of P. C. C. & St. L. general mortgage 5 per cent series B bonds; \$11,706,000 of New York Bay R. R. first mortgage 5 per cent, Series A bonds; \$5,600,000 of P. F. W. & C. common stock; \$10,000,000 of P. C. C. & St. L. capital stock; and \$12,000,000 of Western New York & Pennsylvania common stock. The issues are in connection with the loan by the government to the railroad to enable it to complete the electrification of its line between New York and Washington and to purchase 7000 freight cars and 101 electric locomotives.

SOUTHERN PACIFIC.—R. F. C. Loan.—The Interstate Commerce Commission has modified the certificate in which it approved a loan of \$22,000,000 from the Reconstruction Finance Corporation to permit the advance to the company by February 1 of \$1,810,000 to be used for the payment of interest on bonds then due, in lieu of an

equal amount which had been approved for interest and \$205,700 of equipment obligations.

Average Prices of Stocks and of Bonds

	Jan. 30	Last week	Last year
Average price of 20 representative railway stocks..	47.71	45.79	26.81
Average price of 20 representative railway bonds..	75.55	73.81	58.88

Dividends Declared

Bangor & Aroostook.—Preferred, \$1.75, quarterly; Common, 63c, quarterly, both payable April 1 to holders of record February 28.
Dayton & Michigan.—87½c, semi-annually; 8 Per Cent Preferred, \$1.00, quarterly, both payable April 2 to holders of record March 15.
Hartford & Connecticut Western.—\$1.00, semi-annually, payable February 28 to holders of record February 17.
North Carolina.—7 Per Cent Preferred Guaranteed, \$3.50, semi-annually, payable February 1 to holders of record January 20.
Reading.—First Preferred, \$0.50, quarterly, payable March 8 to holders of record February 15.
Utica Clinton & Binghamton.—\$1.00, payable February 10 to holders of record February 1.

Railway Officers

EXECUTIVE

William Atwill, general manager of the Illinois Central, has been appointed also vice-president, with headquarters as before at Chicago. He succeeds **G. E. Patterson**, vice-president in charge of operation, who, at his own request, has been relieved of the duties incident to this position and has been appointed to the newly-created position of manager of personnel. These appointments became effective on February 1.

Charles B. Sudborough, general traffic manager of the Pennsylvania, at Philadelphia, Pa., who has been appointed assistant vice-president at St. Louis, Mo., as noted in the *Railway Age* of January 27, was born in November 1, 1876, at St. Louis,



Charles B. Sudborough

Mo. He first entered railway service on September 1, 1897, as a register clerk in the freight claim department of the Vandalia (now part of the Pennsylvania) and served successively with this road as a

freight rate quotation clerk, bill of lading clerk, freight solicitor and chief rate clerk. Subsequently he left this company to become industrial traffic manager of the Acme Cement Plaster Company, then returning to the Vandalia as a division freight agent. After being advanced through the positions of assistant general freight agent and general freight agent, he was appointed general freight agent on the Pittsburgh, Cincinnati, Chicago & St. Louis (now also part of the Penna.). In 1920, Mr. Sudborough was advanced to traffic manager of the Southwestern region, with headquarters at St. Louis, Mo., and in 1925 he was sent to Philadelphia as assistant general freight traffic manager of the system, being promoted to general traffic manager a short time later. In 1927 he was appointed assistant vice-president, traffic, with the same headquarters, again assuming the position of general traffic manager in 1932. Mr. Sudborough continued to hold the latter position until his recent appointment.

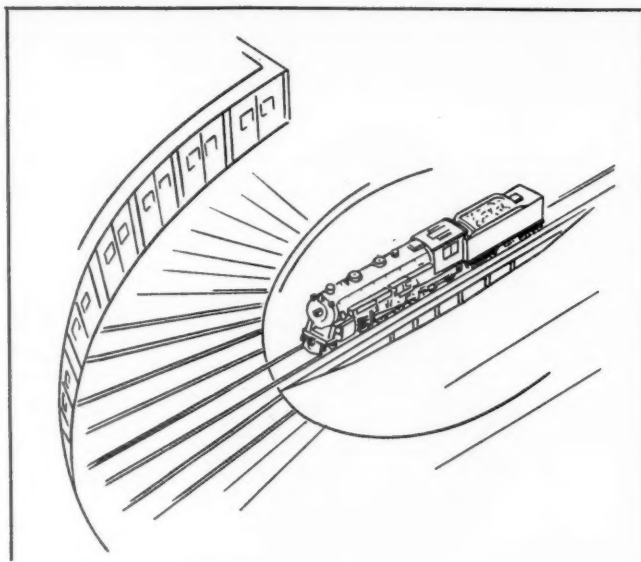
Benjamin McKeen, who has retired as vice-president of the Pennsylvania, with headquarters at St. Louis, Mo., as noted in the *Railway Age* of January 27, had



Benjamin McKeen

been connected with the Pennsylvania continuously for 49 years. He was born on January 23, 1864, at Terre Haute, Ind., and was educated at Worcester Polytechnic Institute and Rose Polytechnic Institute. He entered railway service in 1885 as a draftsman in the motive power department of the Terre Haute & Indianapolis (now part of the Pennsylvania), serving successively for the next two years as a rodman on the engineering corps and as a resident engineer on construction. In 1887 he was advanced to engineer maintenance of way and two years later he was appointed also chief engineer of construction. In 1894, Mr. McKeen was transferred to the operating department as a division superintendent and in 1902 he was appointed to the same position on the Pennsylvania. A year later he was promoted to general manager of the T. H. & I., serving in this position and as general manager of the successor road, the Vandalia (now part of the Penna.), until 1913, when he was made general manager of the Pennsylvania Lines West of Pittsburgh. In 1917, Mr. McKeen was made vice-president in charge of real estate and purchases of the Lines

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What Arch Brick Standardization Means to the Railroads

Where one roundhouse is serving several railroads, the value of Arch Brick standardization is emphasized.

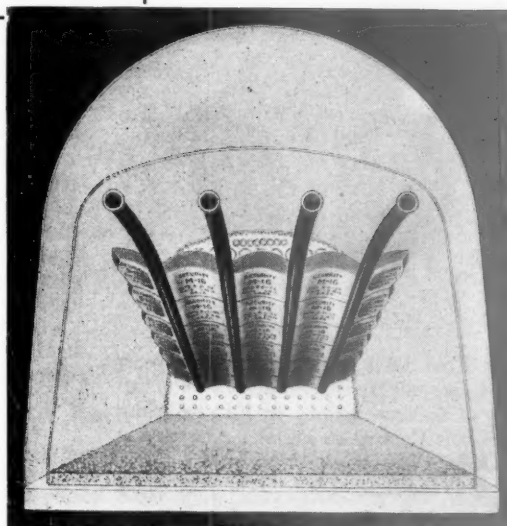
Long before the present agitation for engineering standardization, American Arch Company had brought order out of Arch Brick chaos.

Designs and sizes had been simplified. Instead of each railroad having its own design of Arch Brick, a relatively few sizes and designs served all the locomotives of all the railroads of the country. Arch Brick were made interchangeable and a

*There's More to
SECURITY ARCHES
Than Just Brick*

**HARBISON-WALKER
REFRACTORIES CO.**

Refractory Specialists



great step toward economy had been taken.

This is just one example of the many ways in which the concentration of American Arch Company on Arch Brick for 25 years has benefited the railroads.

**AMERICAN ARCH CO.
INCORPORATED**

*Locomotive Combustion
Specialists*

West of Pittsburgh and in the following year he was appointed vice-president and engineer with the same jurisdiction. From 1920 to 1925, he served as vice-president of the Southwestern region at St. Louis, and in the latter year when the Southwestern and Northwestern regions were combined to form the Western region, Mr. McKeen was appointed resident vice-president with the same headquarters.

FINANCIAL, LEGAL AND ACCOUNTING

Charles Almer Helsell, who has been appointed general attorney for the Illinois Central, with headquarters at Chicago, as noted in the *Railway Age* of January 20, was born on March 1, 1883, at Cedar Rapids, Iowa, and was educated at Iowa State College and the University of Michigan, graduating from the Law school of the latter university in 1906. From the latter year until 1911, Mr. Helsell practiced



Charles A. Helsell

law at Enid, Okla., and during three years of this period he served also as city attorney at the same point. In 1911 he joined the Illinois Central as District Attorney at Ft. Dodge, Iowa, which position he was holding at the time of his recent promotion.

TRAFFIC

P. R. R. Traffic Department Changes

J. B. Large has been appointed general traffic manager of the Pennsylvania, with headquarters at Philadelphia, Pa., succeeding C. B. Sudborough, who has been appointed assistant vice-president. Clarence T. Mackenson, Jr., has been appointed assistant general traffic manager and W. McL. Pomeroy has been appointed assistant to the general traffic manager. E. S. Neilson has been promoted to the position of freight traffic manager at Philadelphia and R. H. Miller has been appointed general freight agent at Pittsburgh.

J. B. Large was born on August 18, 1882, at Philadelphia. He was educated at the Protestant Episcopal Academy of Philadelphia and attended the Wharton School of Finance of the University of Pennsylvania for a year. He entered railway service with the Pennsylvania as clerk at Germantown Junction in October, 1902,

and the following year was transferred to the rate room in the general office at Philadelphia. From 1906 until 1916, Mr. Large held various positions in the freight depart-



John B. Large

ment and on October 15, 1917, he was appointed assistant general freight agent of the Lines East of Pittsburgh and Erie, Pa. The following month he was advanced to general freight agent. At the termination of the period of federal control of the railroads, in March, 1920, Mr. Large was appointed freight traffic manager of the Eastern region. In August, 1925, he was promoted to the position of assistant general traffic manager of the Pennsylvania system and in October, 1927, he was further advanced to general traffic manager at Philadelphia. When the traffic department of the Pennsylvania was reorganized in June, 1932, Mr. Large became assistant general traffic manager, the position he held at the time of his recent appointment.

Clarence T. Mackenson, Jr., was born at Harrisburg, Pa., on June 16, 1886. He entered railway service with the Cumberland Valley R. R. as clerk in the office of the general freight agent in April, 1903, later serving in the positions of claim clerk and rate clerk and as chief clerk for the same railroad. He entered the service of



Clarence T. Mackenson, Jr.

the Pennsylvania in August, 1912, as chief clerk in the division freight agent's office and in July, 1914, he was promoted to chief rate clerk in the general freight

agent's office, in charge of local rates. He was appointed division freight agent of the Eastern Pennsylvania, Western Pennsylvania and Central Pennsylvania divisions at Altoona, Pa., in December, 1916. In November, 1917, Mr. Mackenson was furloughed for military service, returning to railroad service in March, 1919, as special representative for the United States Railroad Administration, later serving successively as division freight agent for the Pennsylvania at Uniontown, Pa., and Pittsburgh, Pa. In March, 1920, upon termination of federal control, he was appointed division freight agent of the Western Pennsylvania and Northern divisions. In August of the following year, he was appointed assistant general freight agent and in July, 1924, he became general freight agent at Pittsburgh, Pa. He was promoted to freight traffic manager at Philadelphia, in August, 1925, and two years later he became assistant general traffic manager. In July, 1929, he was appointed assistant general traffic manager—freight, and in June, 1932, he returned to his former position of freight traffic manager at Philadelphia, the position he held at the time of his recent appointment.

William McL. Pomeroy was born on March 7, 1887, at Chambersburg, Pa.,



William McL. Pomeroy

where he received a preparatory school education. He was graduated from Princeton University in 1908 and entered the service of the Pennsylvania in March, 1909, at North Philadelphia, Pa., where he served in various clerical positions in the freight traffic department. In October, 1911, he was appointed freight solicitor at Buffalo, N. Y., then serving successively until August, 1917, as freight representative at New Haven, Conn., chief clerk to the division freight agent at Erie, Pa., agent for the Empire Line at Philadelphia, Pa., and freight solicitor on the Union Line at Harrisburg, Pa. On the latter date he was furloughed by the Pennsylvania to enter the Ordnance department of the United States Army, serving six months with the A. E. F. in France. He resumed his railroad work on March 1, 1919, as representative in the freight traffic department, later being appointed special agent, United States Railroad Administration. When the railroads were returned to private ownership in March, 1920, Mr. Pomeroy returned to the Pennsylvania and

Superheater Unit Maintenance Costs

can be reduced

AN important point about this statement is that costs for maintaining superheater units at full capacity from shopping to shopping can be reduced by having a thorough job done . . . against the haphazard and seemingly cheaper practice of repairing units or patching them up as they fail from time to time.

Superheater units, because of the severe conditions under which they operate, need the same overhauling and frequently renewal, as do fireboxes, tubesheets, flues, and many other boiler parts. It may appear cheaper to make a few repairs as failures occur, but this is an unreliable practice. It often proves costly through reduction in effectiveness or by failures in service. But superheater units may be renewed and returned for service in a condition equal to new, through the Elesco unit remanufacturing service . . . at about half the cost for new units.

The Elesco unit remanufacturing service provides for complete rebuilding of units, by the same precision methods used in making new units. The units are reconstructed to proper dimensions. They have new forged return bends and ball ends. New bands and supports are applied. New bolts are furnished.

The Elesco unit remanufacturing service is a thorough job of reconditioning . . . cheaper in the long run, because it assures full-capacity and reliability in service.



THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

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Peoples Gas Building
CHICAGO

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Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Throttles

in October, 1921, he was appointed assistant industrial agent for the Eastern region. He was transferred to Pittsburgh in January, 1922, as chief clerk to the traffic manager of the Central region and in July, 1922, he was appointed division freight agent at Buffalo, N. Y. He was promoted to the position of assistant general freight agent at Pittsburgh in August, 1925, and in October, 1927, he became general freight agent at that point. In April, 1929, Mr. Pomeroy was appointed general freight agent at Philadelphia and in January, 1931, he was appointed freight traffic manager with headquarters at Pittsburgh. He became general freight agent at the same point in June, 1932, the position he held at the time of his recent appointment.

E. S. Neilson was born on July 22, 1887, at Warrenton, Va. He was educated at the Episcopal Academy of Philadelphia and entered railway service in April, 1904, as a junior clerk on the Pennsylvania. The following year he was promoted to stenographer in the overcharge department of the general freight agent's office and in November, 1906, he was transferred to the office of the division freight agent at Philadelphia, where he served consecutively as tariff clerk, local rate clerk, chief rate clerk and tariff inspector. He was promoted to freight solicitor at New Haven, Conn., in 1909, and two years later he was transferred in the same capacity to Easton, Pa., later serving in that position at Rochester, N. Y., Reading, Pa., Harrisburg, Pa., and Pittsburgh, Pa. On March 1,



E. S. Neilson

1916, Mr. Neilson was appointed division freight agent at Altoona, Pa., and in December of the same year he was transferred to Erie, Pa., in the same capacity. In 1919, he served with the United States Railroad Administration in the office of the regional director at Philadelphia, returning to the Pennsylvania as division freight and passenger agent in December, 1919. Mr. Neilson was appointed foreign freight agent, with headquarters at Philadelphia, in August, 1925, and in November of the same year he was promoted to the position of general foreign freight agent. In April, 1929, he was appointed freight traffic manager at Philadelphia, and in June, 1932, when the traffic department of this road was reorganized, he was appointed assistant freight traf-

fic manager, the position he held at the time of his recent promotion.

Robert H. Miller was born on September 2, 1884, at Mt. Gilead, O. He entered railway service in February, 1904, as office boy and record clerk for the Pennsylvania at Columbus, O., later in the same year serving as clerk. In Novem-



Robert H. Miller

ber, 1911, he was appointed chief rate clerk in the division freight office at Columbus, and in August, 1916, became freight solicitor at the same point. The following year he was appointed assistant chief clerk in the general freight office at Pittsburgh, Pa. He served as chief clerk in the office of the assistant freight traffic manager at Pittsburgh, and later served in the same capacity in the offices of freight traffic manager and traffic manager. In August, 1925, Mr. Miller was appointed district freight representative and in June, 1926, he was appointed division freight agent at Detroit, Mich. He returned to Pittsburgh in November, 1927, as assistant general freight agent. In June, 1929, he was appointed general freight agent at Pittsburgh. When the traffic department of this road was reorganized in June, 1932, Mr. Miller became assistant general freight agent, the position he held at the time of his recent appointment.

OPERATING

O. J. Meisner, Jr., has been appointed superintendent of the Savannah & Atlanta, with headquarters at Savannah, Ga.

Robert E. Malone, general yardmaster of the Kansas City Southern, with headquarters at Kansas City, Mo., has been promoted to superintendent of terminals, with the same headquarters, to succeed Henry S. Dean who died on January 6.

MECHANICAL

William Donohue, has been appointed acting master mechanic on the Southern Pacific Lines in Texas and Louisiana, with headquarters at Ennis, Tex., replacing T. F. Sullivan, who has retired.

Frederick E. Lyford, special engineer to the executive vice-president, and more recently special engineer to the superintendent of motive power of the Lehigh Valley,

has resigned and has been appointed an examiner for the Railroad Division of the Reconstruction Finance Corporation, with headquarters at Washington, D. C. Mr. Lyford will be a member of the staff of J. W. Barriger, chief examiner of the Railroad Division, and his principal duties will be field investigation of equipment and shop conditions, mechanical practices and related subjects in connection with comprehensive studies being made of railroads in the hands of receivers or trustees, to which R. F. C. loans have been made. Mr. Lyford was born on January 20, 1895, and was graduated in mechanical engineering from Cornell University. After a year in the service of a ship building concern and a machine tool company, he entered the army, serving in the field artillery and in the air service in France as first lieutenant. In 1919 he became assistant sales manager of the Allied Machinery Company of America at New York, which position he resigned in the following year to engage in advertising and sales promotion work for a milling company at Waverly, N. Y. In 1923 he entered the service of the Lehigh Valley as apprentice instructor and also directed classes for the instruction of mechanical department foremen. Subsequently he served as assistant general machine foreman at the Sayre locomotive shops of the Lehigh Valley, during which period he also handled engineering matters for the shop superintendent. Thereafter he was promoted to special engineer to the executive vice-president in which capacity he made special studies of a wide variety of subjects connected with mechanical department questions, including feed water heating, water treatment, locomotive lubrication and the design and economy of new motive power. Mr. Lyford has contributed articles to the *Railway Age* and the *Railway Mechanical Engineer*, one of the more recent of them setting forth the economies achieved by the Lehigh Valley by the installation of the new motive power which it acquired in 1932.

ENGINEERING AND SIGNALING

G. T. Hand, chief engineer of the Lehigh Valley, with headquarters at Bethlehem, Pa., has had his jurisdiction extended to include the maintenance of way department of that road. Mr. Hand will assume the duties previously performed by G. A. Phillips, who resigned on February 1 to become chief engineer of the Delaware, Lackawanna & Western, as reported in the *Railway Age* of January 27. The position of chief engineer of maintenance of the Lehigh Valley has been abolished.

OBITUARY

John E. Hobson, stationer of the Southern, with headquarters at Atlanta, Ga., died on January 24, at his home in that city. Mr. Hobson was born at Richmond, Va., on November 20, 1869, and entered railway service with the Southern on September 1, 1886, serving continuously with this company and its subsidiaries until his death.